

# **federal register**

*HM-181A*

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## **Part II**

### **Department of Transportation**

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**Research and Special Programs  
Administration**

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**49 CFR Parts 171, 172, and 173  
Requirements for Explosives; Notice of  
Proposed Rulemaking**

**DEPARTMENT OF TRANSPORTATION****Research and Special Programs Administration****49 CFR Parts 171, 172, and 173**

(Docket No. HM-181A; Notice No. 90-5)

RIN 2137-AA01

**Requirements for Explosives****AGENCY:** Research and Special Programs Administration (RSPA) DOT.**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** RSPA proposes to amend the Hazardous Materials Regulations (HMR; 49 CFR parts 171-180) with regard to hazard classification, packaging and hazard communication requirements applicable to explosives. The proposed changes are based on the United Nations Recommendations on the Transport of Dangerous Goods (UN Recommendations). The purpose of this action is to: simplify the HMR; promote flexibility and technological advances in packaging; promote safety through better classification and packaging of explosives; and harmonize domestic regulations for explosives with those used internationally. The intended effect of this action is to enhance safety and facilitate international commerce with regard to the transport of explosives.

**DATES:** Comments must be received on or before July 10, 1990.

**ADDRESSES:** Address comments to the Dockets Unit, Research and Special Programs Administration, U.S. Department of Transportation, Washington, DC 20590. Comments should identify the docket and be submitted, if possible, in five copies. Persons wishing to receive confirmation of receipt of their comments should include a self-addressed stamped postcard showing the docket number (i.e., Docket HM-181A). The Dockets Unit is located in room 8419 of the Nassif Building, 400 Seventh Street, SW., Washington, DC 20590. Telephone: (202) 366-5046. The public dockets may be reviewed between the hours of 8:30 a.m. to 5 p.m., Monday through Friday.

**FOR FURTHER INFORMATION CONTACT:** Charles H. Ke (202-366-4545) or Delmer F. Billings (202-366-4488), Office of Hazardous Materials Transportation, RSPA, 400 Seventh Street SW., Washington, DC 20590.

**SUPPLEMENTARY INFORMATION:** This document proposes changes, both editorial and substantive, to substantial portions of the existing HMR as they relate to explosives. These proposals can be separated into two categories: (1)

Modifications to proposals initiated under Docket HM-181, Notice No. 87-4 (52 FR 42772, November 6, 1987; and, (2) new proposals. The relationship of Notice No. 87-4 to this NPRM and the two types of proposals undertaken in this NPRM will be discussed later in this preamble. These changes, if adopted, would reduce the total volume of the HMR, and would provide a basis for the classification of explosives that is consistent with the UN Recommendations.

Due to the length and complexity of the current regulations and this proposal, the supplementary information is presented under the following headings to assist the reader:

- I. Background
- II. Major Features
- III. Review by Sections
- IV. Transition Period and Effective Date of Regulations
- V. Amendatory Language
- VI. Administrative Notices

**I. Background**

On May 5, 1987, RSPA issued a NPRM, entitled "Performance-Oriented Packaging Standards" (Docket No. HM-181; Notice No. 87-4; 52 FR 16482), that proposed sweeping changes to the HMR, particularly with regard to adoption of performance-oriented packaging standards and new or revised requirements for hazard classification and communication. Notice No. 87-4 was republished on November 8, 1987 (52 FR 42772) with corrections and supplemental proposals to the May 5, 1987 publication. The May 5, 1987, Notice No. 87-4 stated:

the time that RSPA began considering the desirability of issuing performance-oriented packaging standards to replace the packaging specifications found in the HMR, it was apparent that explosives would be a major part of any such effort. RSPA's requirements for testing and classing explosives are outdated and many packagings are obsolete. Because the size of any regulatory project covering the classing and packaging of explosives is so great, and because the testing, classing, and packaging of explosives is so specialized, RSPA decided to handle explosives in another rulemaking action which will be issued under Docket HM-181A.

This notice supplements the rulemaking initiated under Notice 87-4 by proposing to revise requirements of the HMR and by modifying certain proposals of Notice No. 87-4, applicable to explosives, based on the UN Recommendations. Substantial background information is provided in the May 5, 1987, publication of Notice No. 87-4, however, the following is a list of the major considerations in support of this proposal:

(1) The UN classification system conveys more directly the hazard characteristics possessed by a given explosive item. Proper classification, or categorization, is necessary to ensure appropriate packaging, hazard communication and handling and, thus, enhance transportation safety.

(2) The UN packaging system is performance-oriented, thereby encouraging use of efficient, yet safe, packagings.

(3) The UN compatibility group concept enhances safety in transportation, as well as storage and emergency response procedures for explosives, by improving the segregation requirements.

(4) For many years, RSPA, with the assistance of representatives of the explosives industry, has actively participated in the development of the UN Recommendations for world-wide transportation and believes that they merit consideration for adoption in the United States.

Requirements of the HMR focus, in part, on hazard classification, packaging, and hazard communication. Explosives are classified after examination of either test results or design of the explosive device. Although certain test methods and criteria are given in the HMR, there is no systematic test scheme to cover all categories of explosives. Additionally, the current explosives classification system only gives a general idea of the hazards associated with an explosive article. For example, some detonators and high explosives are Class A explosives. The designation "Class A" itself does not convey the message that these two types of explosives have distinct hazard properties and must not be transported or stored together. Additional safety provisions, such as segregation and separation requirements, are currently provided separately in the HMR. Such disjointed regulations may lead to confusion and non-compliance.

Current packaging requirements for explosives are based on a specification-oriented concept that is cumbersome to use and technologically outdated. Typical specifications, which are found in 49 CFR part 178, contain very precise requirements for materials of construction, thickness, fastenings, capacity, coatings, openings, joinings and carrying devices. Much of the information contained in a specification is given in great detail and is repetitious. For example, the regulations for wooden boxes specify the thickness and width of boards, kinds and dimensions of nails, and spacing of nails used in joining boxes.

Some DOT specification packagings are obsolete or little used. Others are too expensive to make or too labor-intensive to pack. On the other hand, new and cost efficient packagings for hazardous materials are constantly being developed. Since they are not included in the DOT specifications (part 178), however, new or innovative packagings for hazardous materials may only be used under the terms and conditions of exemptions issued by DOT granting a person relief from applicable portions of the HMR.

The Committee of Experts on the Transport of Dangerous Goods of the UN Economic and Social Council has developed a system of recommended safety standards for the transportation of hazardous materials, including explosives. The UN system for classification of explosives is based on test results (augmented in some cases with specific definitions) coupled with the assignment of a compatibility group letter to convey more specifically the hazardous characteristics of each individual explosive item. The compatibility group letter is tied to segregation requirements for transportation, thus, enhancing safety by specifying the different types of explosives that may be transported together.

Packaging requirements in the UN system are based on performance criteria. Explosive items with the same hazard characteristics are grouped together and are assigned a specific "packaging method." The packaging method specifies, in general terms, the type of packagings, not specific packaging, that may be used to ship an explosive. New and innovative packagings can be used provided that the packaging meets the performance-based standards.

For the foregoing reasons, RSPA is proposing to revise the current packaging and classification system for explosives. Packaging requirements for explosives would be based on a performance-oriented system rather than on a specification-oriented system. Additionally, explosive classifications would be based on performance testing criteria that identifies explosive materials more explicitly than the current system that only identifies the general hazard of the article.

## II. Major Features

### A. Format Improvements

The proposals contained in this document are considered to be a continuation of the proposals to revise and update the HMR that was initiated under Docket No. HM-181; Notice No.

87-4. To that extent, these proposals are intended to reduce the total volume and to improve the format of the HMR. In addition to more simplified and consolidated package manufacturing requirements, all authorized shipping names would be consolidated into a single Hazardous Materials Table (HMT).

### B. Regulatory Features

The significant regulatory proposals of this document are as follows:

1. The UN explosives classification system would replace the current system in the HMR. Proposed hazard class designations consist of two numbers, separated by a period, and followed by a letter. The first number denotes the Class number (Class I is for explosives) and the second number denotes the Division number within the class. The letter denotes the Compatibility Group. The combination of the two numbers and letter forms the classification code. For example, classification code 1.2B denotes Class 1, Division 2, Compatibility Group B.

2. A "packaging method" would be assigned to each explosive listed in the Hazardous Materials Table in § 172.101 (§ 172.101 Table). Certain unique domestic packaging provisions would be accommodated in the § 172.101 Table.

3. Classifications for new explosives would be based on the UN classification methodology, except for the definition of Division 1.4. This methodology includes sequential steps for classifying explosives, test methods, and criteria used for assigning classification codes.

Division 1.4, would be based on the UN methodology, however, the maximum quantity of detonating explosive authorized in a device in this division would be limited to 25 grams (0.9 ounce). Without this limitation, a large explosive device containing as much as 250 grams (8.8 ounces) of cast TNT could be classified as Division 1.4. RSPA believes such a classification is unacceptable for transportation. The HMR currently limit detonating devices which are Class C (i.e., the equivalent to the UN Division 1.4) to 25 grams of explosive materials. RSPA believes that the proper classification for explosive devices containing more than 25 grams (0.9 ounce) of a detonating material is Division 1.1 or 1.2, depending on the hazard characteristics of the device. However, the 25 gram (0.9 ounce) limitation would not apply to devices containing deflagrating explosives.

4. A section containing descriptions of terms for explosive materials and articles would be provided for information.

5. Proper shipping names for explosives would be based on those listed in Chapter 2 of the UN Recommendations. Many explosive materials would be described using specific technical names for proper shipping names rather than by generic descriptions, such as "high explosive", "low explosive", or "propellant explosive".

6. Specific explosive materials may be unique to the U.S. explosives industry. Shipping descriptions, classifications, and handling requirements for these materials would be retained, although authorized for domestic transportation only.

7. Certain explosives would be required or authorized to be packed in packagings or quantities which differ from the UN Recommendations, because they are unique to the U.S. transportation system.

8. Hazard communication requirements would be consistent with those of the UN Recommendations. Many of these requirements already have been proposed in Notice No. 87-4. This proposal supplements Notice No. 87-4 by adding entries for Division 1.6 labels and placards and by proposing to require the marking of "EX numbers" on the outside of packages.

## III. Review by Sections

Note: Unless otherwise noted, this section-by-section review is based on the recodification proposed in Notice No. 87-4 (52 FR 42772, November 6, 1987).

### A. Part 171: General Information, Regulations, Definitions

*Section 171.7.* In § 171.7, one new reference would be added and two existing references would be revised regarding explosive testing for classification purposes.

*Section 171.8.* In § 171.8 new definitions of "Compatibility group letter," "EX number" and "Offshore supply vessel" would be added.

*Section 171.12.* In § 171.12, proposed paragraph (b) is revised to include explosives in all classification codes.

### B. Part 172: Hazardous Materials Table, Special Provisions and Hazardous Materials Communication Regulations

1. Subpart B of Part 172: Table of Hazardous Materials, Special Provisions and Appendix A

The same format used in Notice No. 87-4 is used in this notice. Those entries for which RSPA is proposing variances with the UN or which are not provided for by the UN but are essential for domestic transportation are included in the § 172.101 Table and identified with

the letter "D", in column 1 of the Table. The proper shipping name, classification code, identification number, packing group, packaging requirements, and label are taken from the UN Recommendations. Quantity limitations for air shipments are based on the International Civil Aviation Organization Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Technical Instructions).

The stowage requirements for water shipments are based on the International Maritime Dangerous Goods Code (IMDG Code). However, the proposals contained in this document, because of a time and resource constraint, have not incorporated those changes in stowage requirements, which are only editorial in nature, that will be adopted by the IMDG Code in January of 1991. It is our intention, however, that any final rule issued under this docket will be consistent with the stowage requirements of the IMDG Code.

In proposed § 172.102, those special provisions applicable to explosive (Class 1 materials) would be added. These special provisions, which are noted in column 7 of the Hazardous Materials Table, would apply to multimodal shipments and to bulk and non-bulk packagings.

#### 2. Subpart D of Part 172: Marking

In subpart D of part 172, § 172.320 would be added to require packages be marked with the approval number (i.e., the EX-number) for the explosive. This will communicate to carriers that packages of explosives have been approved for transportation.

#### 3. Subpart E: Labeling

In § 172.400, proposed paragraph (b) is revised by adding an entry for Explosives 1.6. Proposed 172.405(a) is revised to include Class 1 materials. Proposed § 172.411 is revised to include a label for Division 1.6.

#### 4. Subpart F: Placarding

Table 2 of proposed § 172.504 is revised to add a reference to the placard for Division 1.6. Section 172.525 would be added to describe the Division 1.6 placard.

#### C. Part 173: Shippers, General Requirements for Shipments and Packagings

1. A new subpart C and appendix D would be added to read as follows:

a. *Section 173.50: Class 1—Definitions.* This section would define explosives and each division for explosives. In the proposed classification system, explosives are

Class 1 and are further divided into six divisions, namely Divisions 1.1, 1.2, 1.3, 1.4, 1.5, and 1.6. Each division, except for Divisions 1.4 and 1.6, covers explosive substances as well as explosive devices and articles.

b. *Section 173.51: Authorization to offer and transport explosives.* This section proposes to specifically require that all explosives be tested and approved as specified in the HMR prior to shipment.

c. *Section 173.52: Classification codes and compatibility groups of explosives.* The compatibility group letters and classification codes for explosive articles and substances would be included in this section. Except for Division 1.4 Compatibility Group S (1.4S), the compatibility group letter of an explosive item would be assigned by definition, as specified in Table 2 of this section. The division numbers would be based on the results of the testing of the explosive. Altogether there would be 35 classification codes in this new system as compared to only four categories in the current classification system.

d. *Section 173.53: Provisions for using old classifications for explosives.* The current classification system has served as a basis for categorizing hazardous materials outside of the transportation environment. This is particularly true for explosives. Thousands of state and local governments have issued requirements for the handling, storage and use of explosives using the current classification system and descriptions for explosives, particularly in ordinances or codes related to fire safety for storage facilities. Therefore, RSPA is proposing to add § 173.53 to provide a cross reference between the proposed new classification codes and the existing classifications for explosives. This would provide for the continued use of the existing classifications for explosives in non-transportation situations.

e. *Section 173.54: Forbidden explosives.* This section would be equivalent to § 173.51 of the existing HMR and would list those categories of explosives which must not be transported.

f. *Section 173.56: New explosives—definition and procedure for classification and approval.* This section would contain the definition for a new explosive. As defined in the proposal, the definition of a new explosive, which will be essentially the same as it is currently defined in § 173.86, would be broken into three parts. First, any explosive that has not been approved by the Director of the Office of Hazardous Materials Transportation (OHMT), even though the explosive has been produced

previously, would be considered a new explosive. A common misunderstanding has been that if a given explosive has been manufactured or used for some period of time, then it is not a new explosive. This is not correct. For example, "black powder" is a well known explosive. However, black powder may not be shipped by a new manufacturer unless that manufacturer has obtained an approval from the Director, OHMT. One manufacturer's approval may not be used by another. Secondly, any explosive whose formula or manufacturing process has been modified that results in an alteration of the properties of that explosive, would be considered a new explosive. To reduce the compliance burden, RSPA is proposing a provision for designated laboratories to determine if the changes made by a manufacturer actually alter the properties of an explosive to such an extent as to affect safety and to warrant testing of the explosive as a new explosive.

This section also proposes procedures, which would be equivalent to those found in § 173.86 of the existing HMR, for examination, classifying, and approving new explosives. Two laboratories, the Bureau of Explosives and the Bureau of Mines, would be designated as authorized to examine and recommend classification codes for explosives. The Department of Defense (DOD) and the Department of Energy (DOE) would be authorized to class those explosives made by or under the supervision of DOD or DOE. Included in this section would be provisions allowing for the shipment of explosive samples to testing laboratories for the purposes of testing and evaluation.

g. *Section 173.57: Acceptance criteria for new explosives.* This section would contain criteria for specific tests required for substances to be classed as new explosives. Tests for ammonium nitrate-fuel oil mixtures would be included. Additional criteria for determining if a substance is a forbidden explosive are proposed.

h. *Section 173.58: Assignment of class and division for new explosives.* This section proposes to prescribe the specific tests and criteria which must be satisfied for assigning a classification code to a new explosive.

i. *Section 173.59: Description of terms for explosives.* This section would provide nomenclature clarification and descriptions for certain terms and types of explosives. This listing is provided for general information and should not be used as a determining factor when selecting proper shipping descriptions for explosives.

j. *Section 173.60: General packaging requirements for explosives.* This section proposes general packaging requirements for all explosives.

k. *Section 173.61: Mixed packaging requirements.* This section proposes conditions under which explosive substances may be packaged with other materials.

l. *Section 173.62: Specific packaging requirements.* Specific packaging requirements for each explosive are proposed in this section. The section is divided into three parts, the first part sets forth a table of explosives, in which each explosive is listed in numerical order by its identification number followed by a packaging method. The second part provides the detailed packaging requirements for each packaging method and the third part provides additional packaging requirements or exceptions to each packaging method, if appropriate.

m. *Section 173.63: Packaging exceptions.* This section proposes exceptions for packaging and transporting certain explosives domestically, where the requirements are different from those specified in the UN Recommendations.

#### IV. Transition Period and Effective Date of Regulations

If the proposals presented in this notice are adopted in a final rule, RSPA is considering delaying the effective date of a final rule, for most of the regulatory provisions contained therein, for a period of five years from date of publication. The effective date would be consistent with the issuance of a final rule under Docket HM-181, Notice No. 87-4. Voluntary compliance with the new requirements would be authorized immediately upon publication or as soon thereafter as is practicable. A five year implementation period would facilitate the changeover from present requirements to the new requirements and, thus, mitigate the burden of complying with the new regulatory requirements, particularly with regard to hazard communication. Additionally, RSPA will provide a new classification, upon request, for those explosives classed under the current system. Because of the large number of requests that RSPA anticipates, it would be necessary for such requests to be submitted in a timely manner to allow RSPA sufficient time to respond.

#### V. Amendatory Language

The proposals of this NPRM are broken down into two categories: (1) proposals to amend the existing HMR; and (2) modifications of our earlier proposal, initiated under Notice 87-4, to

amend the HMR. For those proposals which are modifications to Notice No. 87-4, the amendatory language will reference the **Federal Register** volume and its page number and the date the previous proposal was published in the **Federal Register**. For example, one amendatory language sentence reads as follows: "In proposed paragraph (e) of § 172.504, as proposed at 52 FR 42944 on November 8, 1987, the entry '1.6..... Explosives 1.6..... 172.525' is added in numeric sequence to Table 2." The page number refers to volume 52, page 42944 of the **Federal Register** (52 FR 42944), which was published on November 8, 1987, where the reader will find a proposal to revise paragraph (e) of § 172.504. This rulemaking is modifying that proposal by inserting "1.6..... Explosives 1.6..... 172.525" in numerical sequence to Table 2. RSPA understands that such a "dual proposal" will cause some confusion, however, RSPA believes that a republication of Notice No. 87-4, incorporating the proposals of this NPRM, would be impractical and burdensome for the reader because of the sheer size of such a document.

#### VI. Administrative Notices

##### A. Executive Order 12291

The effect of this rule, as proposed, does not meet the criteria specified in section 1(b) of Executive Order 12291 and is, therefore, not a major rule, but is a significant rule under the regulatory procedures of the Department of Transportation (44 FR 11034). This proposed rule does not require a Regulatory Impact Analysis, or an environmental assessment or impact statement under the National Environmental Policy Act (42 FR 4321 et seq.). A regulatory evaluation is available for review in the Docket.

##### B. Executive Order 12612

This proposed action has been analyzed in accordance with the principles and criteria in Executive Order 12612 and, based on the information available at this time, RSPA does not believe that the proposed rule would have sufficient Federalism implications to warrant the preparation of a Federalism Assessment. RSPA is proposing standards for the classification and transportation of explosives and is not requiring states to adopt them.

##### C. Impact on Small Entities

Based on limited information concerning size and nature of entities likely affected by this proposed rule, I certify this proposal will not, if promulgated, have a significant

economic impact on a substantial number of small entities under criteria of the Regulatory Flexibility Act. This certification is subject to modification as a result of a review of comments received in response to this proposal.

#### D. Paperwork Reduction Act

The information collection requirements contained in proposed §§ 172.320 and 173.56 are being submitted to the Office of Management and Budget (OMB) for review under the provisions of the Paperwork Reduction Act of 1980 (44 U.S.C. 3504(h)). Comments on the collection of information should be sent to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC, attention: Desk Officer for the Department of Transportation. All comments must reference the title for this notice "Requirements for Explosives".

#### List of Subjects

##### 49 CFR Part 171

Exports, Hazardous materials transportation, Hazardous waste, Imports, Incorporation by reference, Reporting and recordkeeping requirements.

##### 49 CFR Part 172

Hazardous materials transportation, Hazardous waste, Labeling, Packaging and containers, Reporting and recordkeeping requirements.

##### 49 CFR Part 173

Explosives, Hazardous materials transportation, Packaging and containers, Radioactive materials, Reporting and recordkeeping requirements, Uranium.

Issued in Washington, DC on April 19, 1990, under authority delegated in 49 CFR part 106, appendix A.

Alan I. Roberts,

Director, Office of Hazardous Materials Transportation.

In consideration of the foregoing, 49 CFR parts 171 through 173 would be amended as follows (Note: The proposals in this notice are presented in a manner consistent with the format and recodification changes proposed in Docket HM-181, Notice 87-4 (52 FR 42772; November 8, 1987). Where a proposal is a modification to Notice No. 87-4, the appropriate **Federal Register** page number of Volume 52 is provided:

#### PART 171—GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS

1. The authority citation for part 171 would continue to read as follows:

Authority: 49 U.S.C. App. 1802, 1803, 1804, 1805, 1808; 49 CFR part 1.

2. In § 171.7(c), as proposed at 52 FR 42778 on November 6, 1987, the entries in the table for the Department of Defense and the United Nations are revised and an entry for American Pyrotechnics Association (APA) is added in alphabetical sequence as follows:

**§ 171.7 Matter incorporated by reference.**

(c) \* \* \*

Source and name of material	49 CFR reference
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(Add)

American Pyrotechnics Association (APA), P.O. Box 213, Chestertown, MD 21620.

APA Standard 87-1, Standard for Construction and Approval for Transportation of Fireworks and Novelties., September 1987 Edition..	173.56
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(Revise)

Department of Defense (DOD), 2461 Eisenhower Avenue, Alexandria, VA 22331.

DOD TB 700-2; NAV-SEAINST 8020.8; AFTO 11A-1-47; DLAR 8220.1: Explosives Hazard Classification Procedure (December 1989).	173.56
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Source and name of material	49 CFR reference
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(Revise)

United Nations, United Nations Sales Section, New York, N.Y. 10017..

UN Recommendations on the Transport of Dangerous Goods, Sixth Revised Edition (1989).	172.401; 172.407; 172.519
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UN Recommendations on the Transport of Dangerous Goods, Tests and Criteria, First Edition.	173.56; 173.57
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3. In § 171.8, the definitions for "compatibility group letter" and "offshore supply vessel" would be added in appropriate alphabetical order and the definition for "EX number" would be revised to read as follows:

**§ 171.8 Definitions and abbreviations.**

*Compatibility group letter* means a designated alphabetical letter used to categorize different types of explosive substances and articles for purposes of stowage and segregation (See § 173.52 of this subchapter).

*EX number* means a number, preceded by the prefix "EX-", which is assigned by the Director, OHMT, to identify an explosive which has been approved.

*Offshore supply vessel* means a cargo vessel of less than 500 gross tons that

regularly transports goods, supplies and equipment in support of exploration or production of offshore mineral or energy resources.

4. In § 171.12, paragraph (b)(3)(ii), as proposed at 52 FR 42783 on November 6, 1987, is revised to read as follows:

**§ 171.12 Import and export shipments.**

(b) \* \* \*  
(3) \* \* \*  
(ii) A Class 1 material;

**PART 172—HAZARDOUS MATERIALS TABLES, HAZARDOUS MATERIALS, COMMUNICATIONS REQUIREMENTS AND EMERGENCY RESPONSE INFORMATION REQUIREMENTS**

5. The authority citation for part 172 would continue to read as follows:

Authority: 49 U.S.C. App. 1803, 1804, and 1808; and 49 CFR part 1, unless otherwise noted.

6. In § 172.101, as proposed at 52 FR 42783 on November 6, 1987, the following entries are added, in appropriate alphabetical order, to the Hazardous Materials Table beginning at 52 FR 42787:

**§ 172.101 Purpose and use of hazardous materials table.**

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class	Identification Numbers	Pack- ing group	Labels	Special provisions	Packaging authorizations (§ 173.161)			Quantity limitations		Vessel stowage requirements		
							Excep- tions	Non- bulk pack- aging	Bulk packag- ing	Passenger aircraft or railcar	Cargo aircraft only	Cargo vessel	Pass- senger vessel	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)	(10C)
	Ammonium nitrate fertilizer: <i>which is more liable to explode than ammonium nitrate with 0.2 per cent combustible substances, in- cluding any organic substance calculated as carbon, to the ex- clusion of any other added sub- stance.</i>	1.1D	UN0223	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Ammonium nitrate-fuel oil mixture (containing only prilled ammoni- um nitrate and fuel oil).	1.5D	NA0331	II	Explosive 1.5D			62	None	Forbidden	Forbidden	B	5	1E, 5E, 17E
	Ammonium nitrate, <i>with more than 0.2 percent combustible sub- stances, including any organic substance calculated as carbon, to the exclusion of any other added substance.</i>	1.1D	UN0222	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Ammonium perchlorate	1.1D	UN0402	II	1.1D	107		62	None	Forbidden	Forbidden	B	5	1E, 5E, 17E
	Ammonium picrate, <i>dry or wetted with less than 10 percent water, by weight.</i>	1.1D	UN0004	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E, 18E
	Ammunition, illuminating <i>with or without burster, expelling charge or propelling charge.</i>	1.2G	UN0171	II	Explosive 1.2G		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Ammunition, illuminating <i>with or without burster, expelling charge or propelling charge.</i>	1.3G	UN0254	II	Explosive 1.3G		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Ammunition, illuminating <i>with or without burster, expelling charge or propelling charge.</i>	1.4G	UN0297	II	Explosive 1.4G		63(b)	62	None	Forbidden	75kg	A	1, 3	1E, 7E
	Ammunition, incendiary <i>liquid or gel, with burster, expelling charge or propelling charge.</i>	1.3J	UN0247	II	Explosive 1.3J		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Ammunition, incendiary (other than water-activated ammunition), <i>without white phosphorus or phosphides, with or without burster, expelling charge or pro- pelling charge.</i>	1.2G	UN0009	II	Explosive 1.2G		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E, 13E, 14E
	Ammunition, incendiary (other than water-activated ammunition), <i>without white phosphorus or phosphides, with or without burster, expelling charge or pro- pelling charge.</i>	1.3G	UN0010	II	Explosive 1.3G		63(b)	62	None	Forbidden	Forbidden	A	1, 3	1E, 7E

D

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(4) Identification Numbers	(5) Pack- ing group	(6) Labels	(7) Special provisions	(8) Packaging authorizations (§ 173.101)			(9) Quantity limitations		(10) Vessel storage requirements		
							Excep- tions	Non- bulk packag- ing	Bulk packag- ing	Passenger aircraft or railcar	Cargo aircraft only	Cargo vessel	Pas- senger vessel	Other storage provisions
	(2) Ammunition, incendiary (other than water-activated ammunition), without white phosphorus or phosphides, with or without burster, expelling charge or propelling charge.	1.4G	UN0300	II	Explosive 1.4G	(7)	63(b)	62	None	Forbidden	75kg	A	1, 3	1E, 7E, 13E, 14E
	Ammunition, incendiary, white phosphorus, with burster, expelling charge or propelling charge.	1.2H	UN0243	II	Explosive 1.2H		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 2E, 8E, 18E
	Ammunition, incendiary, white phosphorus, with burster, expelling charge or propelling charge.	1.3H	UN0244	II	Explosive 1.3H		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 2E, 8E, 15E
	Ammunition, practice	1.4G	UN0362	II	Explosive 1.4G		63(b)	62	None	Forbidden	75kg	A	1, 2	1E, 7E
	Ammunition, proof	1.4G	UN0363	II	Explosive 1.4G		63(b)	62	None	Forbidden	75kg	A	1, 2	1E, 7E
	Ammunition, smoke (other than water-activated ammunition), without white phosphorus or phosphides, with or without burster, expelling charge or propelling charge.	1.3G	UN0016	II	Explosive 1.3G		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 2E, 8E, 15E
	Ammunition, smoke (other than water-activated ammunition), without white phosphorus or phosphides, with or without burster, expelling charge or propelling charge.	1.4G	UN0303	II	Explosive 1.4G		63(b)	62	None	Forbidden	75kg	E	5	1E, 2E, 8E, 15E
	Ammunition, smoke (other than water-activated ammunition), without white phosphorus or phosphides, with or without burster, expelling charge or propelling charge.	1.2G	UN0015	II	Explosive 1.2G		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 2E, 8E, 15E
	Ammunition, smoke, white phosphorus (other than water-activated ammunition), with burster, expelling charge or propelling charge.	1.3H	UN0246	II	Explosive 1.3H		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 2E, 8E, 15E
	Ammunition smoke, white phosphorus (other than water-activated ammunition), with burster, expelling charge or propelling charge.	1.2H	UN0245	II	Explosive 1.2H		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 2E, 8E, 15E
	Ammunition, tear-producing with burster, expelling charge or propelling charge.	1.2G	UN0018	II	Explosive 1.2G		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 2E, 8E, 15E
	Ammunition, tear-producing with burster, expelling charge or propelling charge.	1.3G	UN0019	II	Explosive 1.3G		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 2E, 8E, 15E
	Ammunition, tear-producing with burster, expelling charge or propelling charge.	1.4G	UN0301	II	Explosive 1.4G		63(b)	62	None	Forbidden	75kg	A	1, 3	1E, 2E, 8E, 15E



(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(4) Identification Numbers	(5) Pack- ing group	(6) Labels	(7) Special provisions	(8) Packaging authorizations (§ 173.***)		(9) Quantity limitations		(10) Vessel stowage requirements		
							Excep- tions	Non- bulk pack- aging	Passenger aircraft or railcar	Cargo aircraft only	Cargo vessel	Pass- enger vessel	Other stowage provisions
					(6)	(7)	(8A)	(8B)	(9A)	(9B)	(10A)	(10B)	(10C)
	Ammunition, toxic (other than water-activated ammunition), with bursting, expelling charge or propelling charge.	1.2K	UN0020	II	Explosive 1.2K		63(b)	62	Forbidden	Forbidden	E	5	2E, 8E
	Ammunition, toxic (other than water-activated ammunition), with bursting, expelling charge or propelling charge.	1.3K	UN0021	II	Explosive 1.3K		63(b)	62	Forbidden	Forbidden	E	5	2E, 8E
	Articles, explosive, n.o.s.	1.1C	UN0462	II	Explosive 1.1C	101		62	Forbidden	Forbidden	E	5	1E, 7E
	Articles, explosive, n.o.s.	1.1D	UN0463	II	Explosive 1.1D	101		62	Forbidden	Forbidden	B	5	1E, 7E
	Articles, explosive, n.o.s.	1.1E	UN0464	II	Explosive 1.1E	101		62	Forbidden	Forbidden	E	5	1E, 7E
	Articles, explosive, n.o.s.	1.1F	UN0465	II	Explosive 1.1F	101		62	Forbidden	Forbidden	E	5	1E, 7E
	Articles, explosive, n.o.s.	1.2C	UN0466	II	Explosive 1.2C	101		62	Forbidden	Forbidden	E	5	1E, 7E
	Articles, explosive, n.o.s.	1.2D	UN0467	II	Explosive 1.2D	101		62	Forbidden	Forbidden	E	5	1E, 7E
	Articles, explosive, n.o.s.	1.2E	UN0468	II	Explosive 1.2E	101		62	Forbidden	Forbidden	E	5	1E, 7E
	Articles, explosive, n.o.s.	1.2F	UN0469	II	Explosive 1.2F	101		62	Forbidden	Forbidden	E	5	1E, 7E
	Articles, explosive, n.o.s.	1.3C	UN0470	II	Explosive 1.3C	101		62	Forbidden	Forbidden	E	5	1E, 7E
	Articles, explosive, n.o.s.	1.4E	UN0471	II	Explosive 1.4E	101		62	Forbidden	Forbidden	E	5	1E, 7E
	Articles, explosive, n.o.s.	1.4F	UN0472	II	Explosive 1.4F	101		62	Forbidden	Forbidden	E	5	1E, 7E
	Articles, explosive, n.o.s.	1.4S	UN0349	II	Explosive 1.4S	101		62	Forbidden	Forbidden	E	5	1E, 7E
	Articles, explosive, n.o.s.	1.4B	UN0350	II	Explosive 1.4B	101		62	Forbidden	Forbidden	E	5	1E, 7E
	Articles, explosive, n.o.s.	1.4C	UN0351	II	Explosive 1.4C	101		62	Forbidden	Forbidden	E	5	1E, 7E
	Articles, explosive, n.o.s.	1.4D	UN0352	II	Explosive 1.4D	101		62	Forbidden	Forbidden	E	5	1E, 5E
	Articles, explosive, n.o.s.	1.4G	UN0353	II	Explosive 1.4G	101		62	Forbidden	Forbidden	E	5	1E, 5E
	Articles, explosive, n.o.s.	1.1L	UN0354	II	Explosive 1.1L	101		62	Forbidden	Forbidden	E	5	12E
	Articles, explosive, n.o.s.	1.2L	UN0355	II	Explosive 1.2L	101		62	Forbidden	Forbidden	B	5	12E
	Articles, explosive, n.o.s.	1.3L	UN0356	II	Explosive 1.3L	101		62	Forbidden	Forbidden	B	5	12E
	Articles, pyrophoric	1.2L	UN0380	II	Explosive 1.2L	101		62	Forbidden	Forbidden	B	5	12E
	Articles, pyrotechnic for technical purposes.	1.1G	UN0428	II	Explosive 1.1G			62	Forbidden	Forbidden	B	5	1E, 7E
	Articles, pyrotechnic for technical purposes.	1.2G	UN0429	II	Explosive 1.2G			62	Forbidden	Forbidden	B	5	1E, 7E
	Articles, pyrotechnic for technical purposes.	1.3G	UN0430	II	Explosive 1.3G			62	Forbidden	Forbidden	B	5	1E, 7E
	Articles, pyrotechnic for technical purposes.	1.4G	UN0431	II	Explosive 1.4G			62	Forbidden	Forbidden	A	1.3	1E, 7E
	Articles, pyrotechnic for technical purposes.	1.4S	UN0432	II	Explosive 1.4S			62	Forbidden	Forbidden	A	1.3	1E, 7E
	Articles, pyrotechnic for technical purposes.	1.4S	UN0432	II	Explosive 1.4S			62	Forbidden	Forbidden	A	1.3	1E, 7E
	Barium azide, dry or wetted with less than 50 percent water, by weight.	1.1A	UN0224	II	Explosive 1.1A	111		62	Forbidden	Forbidden	B	5	2E, 6E
	Barium styphnate	1.1A	NA0473	II	Explosive 1.1A	111		62	Forbidden	Forbidden	B	5	2E, 6E
	Black powder (Gunpowder), com-pressed or Black powder (Gun-powder), in pellets.	1.1D	UN0028	II	Explosive 1.1D			62	Forbidden	Forbidden	B	5	1E, 5E
	Black powder (Gunpowder), granu-lar or as a meal.	1.1D	UN0027	II	Explosive 1.1D			62	Forbidden	Forbidden	B	5	1E, 5E, 10E

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class	Identification numbers	Pack- ing group	Labels	Special provisions	Packaging authorizations (§ 173.161)			Quantity limitations		Vessel stowage requirements			
							Excep- tions	Non- bulk pack- aging	Bulk packag- ing	Passenger aircraft or rampair	Cargo aircraft only	Cargo vessel	Pass- enger vessel	Other stowage provisions	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)	(10C)	
D	Blasting agent, n.o.s.	1.5D	NA0331	II	Explosive 1.5D			62	None	Forbidden	Forbidden	A	1, 2	1E, 5E, 7E	
	Bombs, photo-flash	1.1F	UN0037	II	Explosive 1.1F		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E	
	Bombs, photo-flash	1.1D	UN0038	II	Explosive 1.1D		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E	
	Bombs, photo-flash	1.2G	UN0039	II	Explosive 1.2G		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E	
	Bombs, photo-flash	1.3G	UN0299	II	Explosive 1.3G		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E	
	Bombs, with bursting charge	1.1F	UN0033	II	Explosive 1.1F		63(b)	62	None	Forbidden	Forbidden	E	5	3E, 7E	
	Bombs, with bursting charge	1.1D	UN0034	II	Explosive 1.1D		63(b)	62	None	Forbidden	Forbidden	E	5	3E, 7E	
	Bombs, with bursting charge	1.2D	UN0035	II	Explosive 1.2D		63(b)	62	None	Forbidden	Forbidden	E	5	3E, 7E	
	Bombs, with bursting charge	1.2F	UN0291	II	Explosive 1.2F		63(b)	62	None	Forbidden	Forbidden	E	5	3E, 7E	
	Bombs with flammable liquid, with bursting charge	1.1J	UN0399	II	Explosive 1.1J		63(b)	62	None	Forbidden	Forbidden	E	5	7E, 14E, 16E	
	Bombs with flammable liquid, with bursting charge	1.2J	UN0400	II	Explosive 1.2J		63(b)	62	None	Forbidden	Forbidden	E	5	7E, 14E, 16E	
	Boosters, with detonator	1.1B	UN0225	II	Explosive 1.1B			62	None	None	Forbidden	Forbidden	B	5	2E, 6E
	Boosters, with detonator	1.2B	UN0268	II	Explosive 1.2B			62	None	None	Forbidden	Forbidden	E	5	1E, 7E
	Boosters, without detonator	1.1D	UN0042	II	Explosive 1.1D			62	None	None	Forbidden	Forbidden	E	5	1E, 7E
	Boosters, without detonator	1.2D	UN0283	II	Explosive 1.2D			62	None	None	Forbidden	Forbidden	E	5	1E, 7E
	Bursting, explosive	1.1D	UN0043	II	Explosive 1.1D			62	None	None	Forbidden	Forbidden	B	5	1E, 7E
	Caps, toy (Amorces)	1.4S													
	Cartridges, flash	1.1G	UN0049	II	Explosive 1.1G			62	None	None	Forbidden	Forbidden	E	5	1E, 7E, 9E
	Cartridges, flash	1.3G	UN0050	II	Explosive 1.3G			62	None	None	Forbidden	Forbidden	E	5	1E, 7E, 9E
	Cartridges for weapons, blank	1.1C	UN0326	II	Explosive 1.1C			62	None	None	Forbidden	Forbidden	E	5	1E, 7E, 9E
	Cartridges for weapons, blank (cartridges, small arms, blank)	1.3C	UN0327	II	Explosive 1.3C			62	None	None	Forbidden	Forbidden	E	5	1E, 7E, 9E
	Cartridges for weapons, blank (cartridges, small arms, blank)	1.4C	UN0338	II	Explosive 1.4C			62	None	None	Forbidden	Forbidden	E	5	1E, 7E, 9E
	Cartridges for weapons, blank (cartridges, small arms, blank)	1.2C	UN0413	II	Explosive 1.2C			62	None	None	Forbidden	Forbidden	A	1, 2	1E, 7E, 9E
	Cartridges for weapons, blank (Cartridges, small arms blank)	1.4S	UN0014	II	Explosive 1.4S			62	None	None	Forbidden	Forbidden	A	1, 2	1E, 7E, 9E
	Cartridges for weapons; inert projectile (cartridges, small arms)	1.4S	UN0012	II	Explosive 1.4S			62	None	None	Forbidden	Forbidden	A	1, 2	1E, 7E, 9E
	Cartridges for weapons; inert projectile (cartridges, small arms)	1.2C	UN0328	II	Explosive 1.2C			62	None	None	Forbidden	Forbidden	E	5	1E, 7E, 9E
	Cartridges for weapons; inert projectile (cartridges, small arms)	1.4C	UN0339	II	Explosive 1.4C			62	None	None	Forbidden	Forbidden	E	5	1E, 7E, 9E
	Cartridges for weapons; inert projectile (cartridges, small arms)	1.3C	UN0417	II	Explosive 1.3C			62	None	None	Forbidden	Forbidden	A	1, 3	1E, 7E
	Cartridges for weapons, with bursting charge	1.1F	UN0005	II	Explosive 1.1F			62	None	None	Forbidden	Forbidden	A	1, 3	1E, 7E
	Cartridges for weapons, with bursting charge	1.2F	UN0007	II	Explosive 1.2F			62	None	None	Forbidden	Forbidden	E	5	1E, 7E
	Cartridges for weapons, with bursting charge	1.4F	UN0348	II	Explosive 1.4F			62	None	None	Forbidden	Forbidden	E	5	1E, 7E
	Cartridges for weapons, with bursting charge	1.4E	UN0412	II	Explosive 1.4E			62	None	None	Forbidden	Forbidden	A	1, 2	1E, 7E

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class	Identification Numbers	Pack- ing group	Labels	Special provisions	(8) Packaging authorizations (§ 173.***)			(9) Quantity limitations			(10) Vessel stowage requirements		
							Excep- tions	(8A)	(8B)	(8C)	Passenger aircraft or raicar	Cargo aircraft only	Cargo vessel	Pass- senger vessel	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)	(10C)	
	Cartridges for weapons, with burst- ing charge (projectiles with pro- pelling charge).	1.1E	UN0006	II	Explosive 1.1E			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
	Cartridges for weapons, with burst- ing charge (projectiles with pro- pelling charge).	1.2E	UN0321	II	Explosive 1.2E			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
	Cartridges, oil well.	1.3C	UN0277	II	Explosive 1.3C			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Cartridges, oil well.	1.4C	UN0278	II	Explosive 1.4C			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Cartridges, power device.	1.3C	UN0275	II	Explosive 1.3C	110	63(e)	62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Cartridges, power device.	1.4C	UN0276	II	Explosive 1.4C	110		62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Cartridges, power device.	1.2C	UN0381	II	Explosive 1.2C		63(e)	62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Cartridges, power device (Car- tridges, safety).	1.4S	UN0323	II	Explosive 1.4S	110		62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Cartridges, signal.	1.3G	UN0054	II	Explosive 1.3G			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Cartridges, signal.	1.4G	UN0312	II	Explosive 1.4G			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Cartridges, signal.	1.4S	UN0405	II	Explosive 1.4S			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Cases, cartridge, empty with primer.	1.4S	UN0055	II	Explosive 1.4S			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Cases, cartridges, empty with primer.	1.4C	UN0379	II	Explosive 1.4C			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Cases, combustible, empty, without primer.	1.3C	UN0447	II	Explosive 1.3C			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Cases, combustible, empty, without primer.	1.4C	UN0446	II	Explosive 1.4C			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Charged well casing jet perforating gun (total explosive contents in guns 20 pounds or more per motor vehicle).	1.1D	NA0059	II	Explosive 1.1D			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
	Charged well casing jet perforating gun (total explosive contents in guns not exceeding 20 pounds per motor vehicle or special off- shore down hole tool pallet).	1.4D	NA0440	II	Explosive 1.4D			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
D	Charges, bursting, plastics bonded	1.1D	UN0457	II	Explosive 1.1D			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
	Charges, bursting, plastics bonded	1.2D	UN0458	II	Explosive 1.2D			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
D	Charges, bursting, plastics bonded	1.4D	UN0459	II	Explosive 1.4D			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
	Charges, bursting, plastics bonded	1.4S	UN0460	II	Explosive 1.4S			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E, 9E	
	Charges, demolition	1.1D	UN0048	II	Explosive 1.1D			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
	Charges, depth.	1.1D	UN0056	II	Explosive 1.1D			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
	Charges, explosive, commercial without detonator.	1.1D	UN0442	II	Explosive 1.1D			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
	Charges, explosive, commercial without detonator.	1.2D	UN0443	II	Explosive 1.2D			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
	Charges, explosive, commercial without detonator.	1.2D	UN0443	II	Explosive 1.2D			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
	Charges, explosive, commercial without detonator.	1.2D	UN0443	II	Explosive 1.2D			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
	Charges, explosive, commercial without detonator.	1.2D	UN0443	II	Explosive 1.2D			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	
	Charges, explosive, commercial without detonator.	1.2D	UN0443	II	Explosive 1.2D			62	None	Forbidden	Forbidden	Forbidden	5	1E, 7E	

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(4) Identification Numbers	(5) Packaging group	(6) Labels	(7) Special provisions	(8) Packaging authorizations (§ 173.***)			(9) Quantity limitations			(10) Vessel stowage requirements		
							Excep- tions	Non- bulk packag- ing	Bulk packag- ing	Passenger aircraft or railer	Cargo aircraft only	Cargo vessel	Pas- senger vessel	Other stowage provisions	
															(8A)
	Charges, explosive, commercial without detonator.	1.4D	UN0444	II	Explosive 1.4D			62	None	Forbidden	75kg	E	5	1E, 7E	
	Charges, explosive, commercial without detonator.	1.4S	UN0445	II	Explosive 1.4S			62	None	25kg	100kg	A	1, 2	1E, 7E, 9E	
	Charges, propelling, for cannon	1.2C	UN0414	II	Explosive 1.2C			62	None	Forbidden	Forbidden	E	5	1E, 5E	
	Charges, propelling, for cannon	1.3C	UN0242	II	Explosive 1.3C			62	None	Forbidden	Forbidden	B	5	1E, 5E	
	Charges, propelling, for cannon	1.1C	UN0279	II	Explosive 1.1C			62	None	Forbidden	Forbidden	B	5	1E, 5E	
	Charges, propelling, for rocket motors.	1.1C	UN0271	II	Explosive 1.1C			62	None	Forbidden	Forbidden	B	5	1E, 5E	
	Charges, propelling, for rocket motors.	1.3C	UN0272	II	Explosive 1.3C			62	None	Forbidden	Forbidden	E	5	1E, 5E	
	Charges, propelling, for rocket motors.	1.2C	UN0415	II	Explosive 1.2C			62	None	Forbidden	Forbidden	B	5	1E, 5E	
	Charges, propelling, for rocket motors, composite mixture.	1.1C	UN0273	II	Explosive 1.1C			62	None	Forbidden	Forbidden	B	5	1E, 5E	
	Charges, propelling, for rocket motors, composite mixture.	1.3C	UN0274	II	Explosive 1.3C			62	None	Forbidden	Forbidden	E	5	1E, 7E	
	Charges, propelling, for rocket motors, composite mixture.	1.2C	UN0416	II	Explosive 1.2C			62	None	Forbidden	Forbidden	B	5	1E, 5E	
	Charges, shaped, commercial without detonator.	1.2D	UN0439	II	Explosive 1, 2D			62	None	Forbidden	Forbidden	B	5	1E, 7E	
	Charges, shaped, commercial without detonator.	1.4D	UN0440	II	Explosive 1.4D			62	None	Forbidden	75kg	E	5	1E, 7E	
	Charges, shaped, commercial without detonator.	1.4S	UN0441	II	Explosive 1.4S			62	None	25kg	100kg	A	1, 2	1E, 7E, 9E	
	Charges, shaped, commercial without detonator.	1.2D	UN0439	II	Explosive 1.2D			62	None	Forbidden	Forbidden	B	5	1E, 7E	
	Charges, shaped, commercial, without detonator.	1.1D	UN0059	II	Explosive 1.1D			62	None	Forbidden	Forbidden	E	5	1E, 7E	
	Charges, shaped, flexible, linear, metal clad.	1.4D	UN0237	II	Explosive 1.4D			62	None	Forbidden	75kg	E	5	1E, 7E	
	Charges, shaped, flexible, linear, metal clad.	1.1D	UN0288	II	Explosive 1.1D		101	62	None	Forbidden	Forbidden	B	5	1E, 7E	
	Charges, supplementary explosive	1.1D	UN0060	II	Explosive 1.1D			62	None	Forbidden	Forbidden	E	5	1E, 7E	
	Components, explosive train, n.o.s.	1.2B	UN0382	II	Explosive 1.2B	101		62	None	Forbidden	Forbidden	B	5	1E, 6E	
	Components, explosive train, n.o.s.	1.4B	UN0383	II	Explosive 1.4B	101		62	None	Forbidden	75kg	E	5	1E, 7E	
Components, explosive train, n.o.s.	1.4S	UN0384	II	Explosive 1.4S	101		62	None	25kg	100kg	A	1, 2	1E, 7E, 9E		
Components, explosive train, n.o.s.	1.1B	UN0461	II	Explosive 1.1B	101		62	None	Forbidden	Forbidden	B	5	1E, 5E		
Contrivances, water-activated, with bursting, expelling charge or propelling charge.	1.2L	UN0248	II	Explosive 1.2L	101		62	None	Forbidden	Forbidden	B	5	2E, 8E		
Contrivances, water-activated, with bursting, expelling charge or propelling charge.	1.3L	UN0249	II	Explosive 1.3L	101		62	None	Forbidden	Forbidden	B	5	2E, 8E		
Cord, detonating, flexible	1.1D	UN0065	II	Explosive 1.1D	102	63(a)	62	None	Forbidden	Forbidden	B	5	1E, 7E		
Cord, detonating, flexible	1.4D	UN0289	II	Explosive 1.4D		F	62	None	Forbidden	75kg	E	5	1E, 7E		
Cord (Fuse), detonating, metal clad	1.2D	UN0102	II	Explosive 1.2D			62	None	Forbidden	Forbidden	B	5	1E, 7E		
Cord (Fuse), detonating, metal clad	1.1D	UN0290	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 7E		

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(4) Identification Numbers	(5) Pack- ing group	(6) Labels	(7) Special provisions	(8) Packaging authorizations (§ 173.16)			(9) Quantity limitations		(10) Vessel stowage requirements				
							Excep- tions (8A)	Non- bulk pack- aging (8B)	Bulk packag- ing (8C)	Passenger aircraft or railer (9A)	Cargo aircraft only (9B)	Cargo vessel (10A)	Pass- enger vessel (10B)	Other stowage provisions (10C)		
(1)	Cord (Fuse), detonating, mild effect metal clad. Cord, igniter. Cutters, cable, explosive	1.4D	UN0104	II	Explosive 1.4D			62	None	Forbidden	75kg	E	5	5	1E, 7E.	
		1.4G	UN0066	II	Explosive 1.4G			62	None	Forbidden	75kg	B	5	5	1E, 7E, 9E	
		1.4S	UN0070	II	Explosive 1.4S			62	None	25kg	100kg	A	1, 2	1, 2	1E, 7E, 9E	
		1.1D	UN0484	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	5	1E, 5E	
		1.1D	UN0226	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	5	1E, 5E	
	Cyclotetramethylenetetranitramine; (Octogen; HMX), desensitized. Cyclotetramethylenetetranitramine (HMX; Octogen), wetted with not less than 15 percent water, by weight or Cyclotetramethylenetetranitramine (HMX; Octogen) desensitized with Dnol less than 10 percent phlegmatizer, Dry weight. Cyclotetramethylenetetranitramine; (Cyclonite; Hexogen; RDX), desensitized.	1.1D	UN0463	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	5	1E, 5E	
		1.1D	UN0391	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	5	1E, 5E	
	Cyclotrimethylenetrinitramine (Cyclonite; Hexogen; RDX), and Cyclotetramethylenetetranitramine (HMX; Octogen) mixtures, wetted with not less than 15 percent water, by weight Cyclotrimethylenetrinitramine (Cyclonite; Hexogen; RDX) and CyclamethyDnetranitramine (HMX; Octogen) mixtures desensitized with not less than 10 Dry centDphlegmatizer, bCweight.	1.1D	UN0072	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	5	1E, 5E	
	Cyclotrimethylenetrinitramine (Cyclonite; Hexogen; RDX) wetted with not less than 15 per cent water, by weight or Cyclotrimethylenetrinitramine (Cyclonite; Hexogen; RDX) desensitized with not less than 10 per cent phlegmatizer, by weight. Deflagrating metal salts of aromatic nitroderivatives, n.o.s. Detonator assemblies, non-electric for blasting. Detonator assemblies, non-electric, for blasting.	1.3C	UN0132	II	Explosive 1.3C			62	None	Forbidden	75kg	E	5	5	1E, 5E	
		1.1B	UN0360	II	Explosive 1.1B			62	None	Forbidden	Forbidden	E	5	5	2E, 6E	
1.4B		UN0361	II	Explosive 1.4B			62	None	Forbidden	75kg	E	5	5	1E, 7E		
1.1B		UN0030	II	Explosive 1.1B			62	None	Forbidden	Forbidden	E	5	5	2E, 6E		
1.4B		UN0255	II	Explosive 1.4B			62	None	Forbidden	75kg	E	5	5	1E, 7E		
1.4S		UN0456	II	Explosive 1.4S			62	None	25 kg	100 kg	A	1, 2	1, 2	1E, 7E, 9E		
Detonators for ammunition Detonators for ammunition	1.1B	UN0073	II	Explosive 1.1B			62	None	Forbidden	Forbidden	E	5	5	2E, 6E		
	1.2B	UN0364	II	Explosive 1.2B			62	None	Forbidden	Forbidden	E	5	5	2E, 6E		

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(4) Identification Numbers	(5) Packaging group	(6) Labels	(7) Special provisions	(8) Packaging authorizations (§ 173.155)			(9) Quantity limitations		(10) Vessel stowage requirements		
							Excep- tions (8A)	Non- bulk pack- aging (8B)	Bulk packag- ing (8C)	Passenger aircraft or railcar (9A)	Cargo aircraft only (9B)	Cargo vessel (10A)	Pass- enger vessel (10B)	Other stowage provisions (10C)
D	Detonators for ammunition	1.4B	UN0365	II	Explosive 1.4B			62	None	Forbidden	75kg	E	5	1E, 7E
	Detonators for ammunition	1.4S	UN0366	II	Explosive 1.4S			62	None	25kg	100kg	A	1, 2	1E, 7E, 9E
	Detonators, non-electric, for blasting	1.1B	UN0029	II	Explosive 1.1B			62	None	Forbidden	Forbidden	B	5	2E, 6E
	Detonators, non-electric, for blasting	1.4B	UN0267	II	Explosive 1.4B			62	None	Forbidden	75kg	E	5	1E, 7E
	Detonators, non-electric for blasting	1.4S	UN0455	II	Explosive 1.4S			62	None	25 kg	100 kg	A	1, 2	1E, 7E, 9E
	Diazodinitrophenol, wetted with not less than 40 per cent water, by weight, or mixture of alcohol and water	1.1A	UN0074	II	Explosive 1.1A	111		62	None	Forbidden	Forbidden	B	5	2E, 6E
	Diethylene glycol dinitrate, desensitized with not less than 25 per cent non-volatile water-insoluble phlegmatizer, by weight	1.1D	UN0075	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 4E, 21E
	Dinitrophenolates (alkali metals), dry or wetted with less than 15 per cent water, by weight	1.3C	UN0077	II	Explosive 1.3C			62	None	Forbidden	Forbidden	E	5	1E, 5E
	Dinitrophenol, dry or wetted with less than 15 per cent water, by weight	1.1D	UN0076	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E, 18E
	Dinitrosorcinol, dry or wetted with less than 15 per cent water, by weight	1.1D	UN0078	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E, 18E
	Dinitrosobenzene	1.3C	UN0406	II	Explosive 1.3C			62	None	Forbidden	Forbidden	E	5	1E, 5E
	Dipicryl sulfide, dry or wetted with less than 10 per cent water, by weight	1.1D	UN0401	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Explosive, blasting, type A	1.1D	UN0081	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E, 11E, 17E, 21E
	Explosive, blasting, type B	1.1D	UN0082	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E, 17E, 21E
	Explosive, blasting, type B	1.5D	UN0331	II	Explosive 1.5D	105, 106		62	None	Forbidden	Forbidden	A	1, 2	1E, 5E, 17E
	Explosive, blasting type C	1.1D	UN0083	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E, 22E
	Explosive, blasting, type D	1.1D	UN0084	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Explosive, blasting, type E	1.1D	UN0241	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E, 17E
D	Explosive, blasting, type E	1.5D	UN0332	II	Explosive 1.5D	105, 106		62	None	Forbidden	Forbidden	A	1, 2	1E, 5E
	Explosive pest control devices	1.1E	NA0006	II	Explosive 1.1E			62	None	Forbidden	Forbidden	E	5	1E, 7E, 5E
D	Explosive pest control devices	1.4E	NA0412	II	Explosive 1.4E			62	None	Forbidden	75 kg	E	5	1E, 7E
	Fireworks	1.1G	UN0333	II	Explosive 1.1G	108		62	None	Forbidden	Forbidden	E	5	1E, 7E 19E

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(4) Identification Numbers	(5) Pack- ing group	(6) Labels	(7) Special provisions	(8) Packaging authorizations (§ 173.161)			(9) Quantity limitations		(10) Vessel stowage requirements		
							Excep- tions	Non- bulk pack- aging	Bulk packag- ing	Passenger aircraft or raicar	Cargo aircraft only	Cargo vessel	Pass- senger vessel	Other stowage provisions
							(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)	(10C)
	Fireworks	1.2G	UN0334	II	Explosive 1.2G	108		62	None	Forbidden	Forbidden	E	5	1E, 7E, 19E
	Fireworks	1.3G	UN0335	II	Explosive 1.3G	108		62	None	Forbidden	Forbidden	A	1, 3	1E, 7E, 9E, 19E
	Fireworks	1.4G	UN0336	II	Explosive 1.4G	108		62	None	Forbidden	75kg	A	1, 3	1E, 7E, 9E, 19E
	Fireworks	1.4S	UN0337	II	Explosive 1.4S	108		62	None	25kg	100kg	A	1, 3	1E, 7E, 9E
	Flares, aerial	1.3G	UN0083	II	Explosive 1.3G			62	None	Forbidden	75kg	A	1, 3	1E, 7E, 9E
	Flares, aerial	1.4G	UN0403	II	Explosive 1.4G			62	None	Forbidden	75kg	A	1, 3	1E, 7E, 9E
	Flares, aerial	1.4S	UN0404	II	Explosive 1.4S			62	None	25kg	100kg	A	1, 3	1E, 7E, 9E
	Flares, aerial	1.1G	UN0420	II	Explosive 1.1G			62	None	Forbidden	Forbidden	B	1, 5	1E, 7E, 9E
	Flares, aerial	1.2G	UN0421	II	Explosive 1.2G			62	None	Forbidden	Forbidden	B	1, 5	1E, 7E, 9E
	Flares surface	1.1G	UN0418	II	Explosive 1.1G			62	None	Forbidden	Forbidden	B	1, 5	1E, 7E, 9E
	Flares, surface	1.2G	UN0419	II	Explosive 1.2G			62	None	Forbidden	Forbidden	B	1, 5	1E, 7E, 9E
	Flares, surface	1.3G	UN0082	II	Explosive 1.3G			62	None	Forbidden	75kg	A	1, 3	1E, 7E, 9E
	Fracturing devices, explosive, for oil wells.	1.1D	UN0089	II	Explosive 1.1D			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Fuse, igniter tubular metal clad	1.4G	UN0103	II	Explosive 1.4G			62	None	Forbidden	75kg	A	1, 3	1E, 7E, 9E
	Fuse, instantaneous, non-detonat- ing.	1.3G	UN0101	II	Explosive 1.3G			62	None	Forbidden	Forbidden	A	1, 3	1E, 7E, 9E
	Fuse, safety	1.4S	UN0105	II	Explosive 1.4S			62	None	25kg	100kg	A	3	1E, 7E, 9E
	Fuzes, detonating	1.1B	UN0106	II	Explosive 1.1B			62	None	Forbidden	Forbidden	E	5	2E, 6E
	Fuzes, detonating	1.2B	UN0107	II	Explosive 1.2B			62	None	Forbidden	Forbidden	E	5	2E, 6E
	Fuzes, detonating	1.4B	UN0257	II	Explosive 1.4B			62	None	Forbidden	75kg	E	5	1E, 7E
	Fuzes, detonating	1.4S	UN0367	II	Explosive 1.4S			62	None	25kg	100kg	A	1, 2	1E, 7E, 9E
	Fuzes, detonating, with protective features.	1.1D	UN0408	II	Explosive 1.1D			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Fuzes, detonating, with protective features.	1.2D	UN0409	II	Explosive 1.2D			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Fuzes, detonating, with protective features.	1.4D	UN0410	II	Explosive 1.4D			62	None	Forbidden	75kg	E	5	1E, 7E
	Fuzes, igniting	1.3G	UN0316	II	Explosive 1.3G			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Fuzes, igniting	1.4G	UN0317	II	Explosive 1.4G			62	None	Forbidden	75kg	A	1, 2	1E, 7E
	Fuzes, igniting	1.4S	UN0368	II	Explosive 1.4S			62	None	25kg	100kg	A	1, 2	1E, 7E, 9E
	Grenades, hand or rifle, with burst- ing charge.	1.1D	UN0284	II	Explosive 1.1D			62	None	Forbidden	Forbidden	E	5	1E, 7E

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Symbols	Hazardous materials descriptions and proper shipping names	Hazard class	Identification Numbers	Packaging group	Labels	Special provisions	(8) Packaging authorizations (612, ...)			(9) Quantity limitations		(10) Vessel stowage requirements		
							Excep-tions	Non-bulk pack-aging	Bulk pack-aging	Passenger aircraft or railcar	Cargo aircraft only	Cargo vessel	Passenger vessel	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)	(10C)
	Grenades, hand or rifle, with bursting charge.	1.2D	UN0285	II	Explosive 1.2D		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Grenades, hand or rifle, with bursting charge.	1.1F	UN0292	II	Explosive 1.1F		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Grenades, hand or rifle, with bursting charge.	1.2F	UN0293	II	Explosive 1.2F		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Grenades practice.	1.4G	UN0452	II	Explosive 1.4G		63(b)	62	None	Forbidden	75kg	E	5	1E, 7E
	Grenades, practice, hand or rifle.	1.4S	UN0110	II	Explosive 1.4S		63(b)	62	None	Forbidden	100kg	A	1, 2	1E, 7E, 9E
	Grenades, practice, hand or rifle.	1.3G	UN0318	II	Explosive 1.3G		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Grenades, practice, hand or rifle.	1.2G	UN0372	II	Explosive 1.2G		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Guanyl nitrosaminoquanylidene hydrazine, wetted with not less than 30 per cent water, by weight.	1.1A	UN0113	II	Explosive 1.1A	111	63(b)	62	None	Forbidden	Forbidden	B	5	2E, 6E
	Guanyl nitrosaminoquanyltetrazene (Tetrazene), wetted with not less than 30 per cent water by weight, or mixture of alcohol and water.	1.1A	UN0114	II	Explosive 1.1A	111		62	None	Forbidden	Forbidden	B	5	2E, 6E
	Hexanitrodiphenylamine (Dipicrylamine; Hexyl).	1.1D	UN0079	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Hexanitrostilbene.	1.1D	UN0392	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 4E, 10E
	Hexatonal, cast.	1.1D	UN0393	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Hexolite, dry or wetted with less than 15 per cent water, by weight.	1.1D	UN0118	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Igniters.	1.1G	UN0121	II	Explosive 1.1G			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Igniters.	1.2G	UN0314	II	Explosive 1.2			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Igniters.	1.3G	UN0315	II	Explosive 1.3G			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Igniters.	1.4G	UN0325	II	Explosive 1.4G			62	None	Forbidden	75kg	A	1, 3	1E, 7E
	Jet perforating guns, charged oil well, without detonator.	1.1D	UN0124	II	Explosive 1.1D			63(g)	62	Forbidden	Forbidden	B	5	1E, 7E, 9E
	Jet perforating guns, charged oil well, without detonator.	1.4D	NA0124	II	Explosive 1.4D	114	63 (g)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Lead azide, wetted with not less than 20 per cent water, by weight, or mixture of alcohol and water.	1.1A	UN0129	II	Explosive 1.1A	111		62	None	Forbidden	Forbidden	B	5	2E, 6E
	Lead mononitroresorcinate	1.1A	NA0473	II	Explosive 1.1A	111		62	None	Forbidden	Forbidden	B	5	2E, 6E
	Lead stypnate (Lead trinitroresorcinate), wetted with not less than 20 per cent water, by weight (or mixture of alcohol and water).	1.1A	UN0130	II	Explosive 1.1A	111		62	None	Forbidden	Forbidden	B	5	2E, 6E
	Lighters, fuse	1.4S	UN0131	II	Explosive 1.4S			62	None	25kg	100kg	A	1	1E, 7E, 9E
	Mannitol hexanitrate (Nitromannite), wetted with not less than 40 per cent water, by weight or mixture of alcohol and water	1.1A	NA0133	II	Explosive 1.1A	111		62	None	Forbidden	Forbidden	B	5	1E, 5E



Symbols	Hazardous materials descriptions and proper shipping names	Hazard class	Identification numbers	Pack- ing group	Labels	Special provisions	Packaging authorizations (§ 173.***)		Quantity limitations		Vessel stowage requirements				
							Excep- tions	(8A) (8B)	Non- bulk pack- aging	Bulk packag- ing	(9A) (9B)	Cargo vessel	Pass- enger vessel	Other stowage provisions	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)	(10C)	
	Mannitol hexanitrate (Nitromannite), wetted with not less than 40 per- cent water, by weight or mixture of alcohol and water.	1.1D	UN0133	II	Explosive 1.1D	111		62	None	Forbidden	Forbidden	B	5	1E, 5E	
	5-Mercapto-tetrazol-1-acetic acid	1.4C	UN0448	II	Explosive 1.4C			62	None	Forbidden	75kg	B	5	1E, 5E	
	Mercury fulminate, wetted with not less than 20 percent water, or mixture of alcohol and water, by weight.	1.1A	UN0135	II	Explosive 1.1A	111		62	None	Forbidden	Forbidden	B	5	2E, 6E	
	Mines with bursting charge	1.1F	UN0136	II	Explosive 1.1F		63(b)	62	None	Forbidden	Forbidden	E	5	2E, 7E	
	Mines with bursting charge	1.1D	UN0137	II	Explosive 1.1D		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E	
	Mines with bursting charge	1.2D	UN0138	II	Explosive 1.2F		63(b)	62	None	Forbidden	Forbidden	E	5	3E, 7E	
	5-Nitrobenzotriazol	1.1D	UN0385	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	3E, 7E	
	Nitrocellulose, dry or wetted with less than 25 percent water (or alcohol), by weight.	1.1D	UN0340	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E	
	Nitrocellulose, plasticized with not less than 18 percent plasticizing substance, by weight.	1.3C	UN0343	II	Explosive 1.3C			62	None	Forbidden	Forbidden	Forbidden	E	5	1E, 5E
	Nitrocellulose, unmodified or plas- ticized with less than 18 percent plasticizing substance, by weight.	1.1D	UN0341	II	Explosive 1.1D			62	None	Forbidden	Forbidden	Forbidden	B	5	1E, 5E
	Nitrocellulose, wetted with not less than 25 percent alcohol, by weight.	1.3C	UN0342	II	Explosive 1.3C			62	None	Forbidden	Forbidden	Forbidden	E	5	1E, 5E
	Nitroglycerin, desensitized with not less than 40 percent non-volatile water insoluble phlegmatizer, by weight.	1.1D	UN0143	II	Explosive 1.1D			62	None	Forbidden	Forbidden	Forbidden	B	5	1E, 4E
	Nitroglycerin, solution in alcohol, with more than 1 percent but not more than 10 percent nitrogly- cerin.	1.1D	UN0144	II	Explosive 1.1D			62	None	Forbidden	Forbidden	Forbidden	B	5	1E, 5E, 21E
	Nitroguanidine (Picrite), dry or wetted with less than 20 percent water, by weight.	1.1D	UN0282	II	Explosive 1.1D			62	None	Forbidden	Forbidden	Forbidden	B	5	1E, 5E
	Nitrostarch, dry or wetted with less than 20 percent water, by weight.	1.1D	UN0146	II	Explosive 1.1D			62	None	Forbidden	Forbidden	Forbidden	B	5	1E, 5E
	Nitro urea	1.1D	UN0147	II	Explosive 1.1D			62	None	Forbidden	Forbidden	Forbidden	B	5	1E, 5E
	Octolite (Octol), dry or wetted with less than 15 percent water, by weight.	1.1D	UN0266	II	Explosive 1.1D	104		62	None	Forbidden	Forbidden	Forbidden	B	5	1E, 5E

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(4) Identification Numbers	(5) Packaging group	(6) Labels	(7) Special provisions	(8) Packaging authorizations (§ 173.161)			(9) Quantity limitations		(10) Vessel stowage requirements		
							Excep- tions	Non- bulk pack- aging	Bulk packag- ing	Passenger aircraft or raiser	Cargo aircraft only	Cargo vessel	Pass- enger vessel	Other stowage provisions
D	(1)						(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)	(10C)
	Pentaerythrite tetranitrate (Pentaerythritol tetranitrate; PETN) wetted with not less than 25 percent water, by weight, or Pentaerythrite tetranitrate (Pentaerythritol tetranitrate; PETN) desensitized with not less than 15 percent phlegmatizer by weight.	1.1D	NA0150	II	Explosive 1.1A	111		62	None	Forbidden	Forbidden	B	5	1E, 5E
	Pentaerythrite tetranitrate (PETN) with not less than 7 percent wax by weight.	1.1D	UN0411	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Pentolite, dry or wetted with less than 15 percent water, by weight.	1.1D	UN0151	I	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Flash powder	1.1G	UN0094	II	Explosive 1.1G			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Photo-flash powder, in units	1.2G	UN0096	II	Explosive 1.1G			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Flash powder	1.3G	UN0305	II	Explosive 1.3G			62	None	Forbidden	Forbidden	E	5	1E, 5E
	Potassium salts of aromatic nitroderivatives, explosive.	1.3C	UN0158	II	Explosive 1.3C			62	None	Forbidden	Forbidden	E	5	1E, 5E, 21E
	Powder cake (powder paste) wetted with not less than 35 percent water, by weight.	1.3C	UN0159	II	Explosive 1.3C			62	None	Forbidden	Forbidden	E	5	1E, 21E, 5E
	Powder cake; (powder paste) wetted with not less than 17 percent alcohol by weight.	1.1C	UN0433	II	Explosive 1.1C			62	None	Forbidden	Forbidden	B	5	1E, 5E, 21E
	Powder, smokeless	1.1C	UN0160	II	Explosive 1.1C			62	None	Forbidden	Forbidden	B	5	1E, 4E, 10E
	Powder, smokeless	1.3C	UN0161	II	Explosive 1.3C		63(c)	62	None	Forbidden	Forbidden	E	5	1E, 4E, 10E
	Primers, cap type	1.4S	UN0044	II	Explosive 1.4S			62	None	25 kg	100 kg	A	1, 2	1E, 7E, 9E
	Primers, cap type	1.1B	UN0377	II	Explosive 1.1B			62	None	Forbidden	Forbidden	E	5	2E, 6E
	Primers, cap type	1.4B	UN0378	II	Explosive 1.4B			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Primers, tubular	1.3G	UN0319	II	Explosive 1.3G			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Primers, tubular	1.4G	UN0320	II	Explosive 1.4G			62	None	Forbidden	75 kg	E	5	1E, 7E
	Primers, tubular	1.4S	UN0376	II	Explosive 1.4S			62	None	25 kg	100kg	A	1, 2	1E, 7E, 9E
	Projectiles, inert with tracer.	1.4S	UN0345	II	Explosive 1.4S		63(b)	62	None	25kg	100kg	A	1, 2	1E, 7E, 9E
	Projectiles, inert, with tracer.	1.3G	UN0424	II	Explosive 1.3G		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Projectiles, inert, with tracer.	1.4G	UN0425	II	Explosive 1.4G		63(b)	62	None	Forbidden	75kg	A	1, 2	1E, 7E
	Projectiles, with bursler or expelling charge.	1.2D	UN0346	II	Explosive 1.2D		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Projectiles, with bursler or expelling charge.	1.4D	UN0347	II	Explosive 1.4D		63(b)	62	None	Forbidden	75kg	A	1, 2	1E, 7E
	Projectiles, with bursler or expelling charge.	1.2F	UN0426	II	Explosive 1.2F		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Projectiles, with bursler or expelling charge.	1.4F	UN0427	II	Explosive 1.4F		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Projectiles, with bursler or expelling charge.	1.2G	UN0434	II	Explosive 1.2G		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(4) Identification numbers	(5) Pack- ing group	(6) Labels	(7) Special provisions	(8) Packaging authorizations (§ 173.33)			(9) Quantity limitations		(10) Vessel stowage requirements				
							Excep- tions	Non- bulk pack- aging	Bulk pack- aging	Passenger aircraft or railcar	Cargo aircraft only	Cargo vessel	Pass- enger vessel	Other storage provisions		
	Projectiles, with burster or expelling charge.	1.4G	UN0435	II	Explosive 1.4G		63(b)	62	None	Forbidden	75kg	(9B)	(10A)	(10B)	(10C)	
	Projectiles, with bursting charge.	1.1F	UN0167	II	Explosive 1.1F		63(b)	62	None	Forbidden	Forbidden		E	5	1E, 7E	
	Projectiles, with bursting charge.	1.1D	UN0168	II	Explosive 1.1D		63(b)	62	None	Forbidden	Forbidden		E	5	1E, 7E	
	Projectiles, with bursting charge.	1.2D	UN0169	II	Explosive 1.2D		63(b)	62	None	Forbidden	Forbidden		E	5	1E, 7E	
	Projectiles, with bursting charge.	1.2F	UN0324	II	Explosive 1.2F		63(b)	62	None	Forbidden	Forbidden		E	5	1E, 7E	
	Projectiles, with bursting charge.	1.4D	UN0344	II	Explosive 1.4D		63(b)	62	None	Forbidden	75kg		E	5	1E, 7E	
	Propellant explosive, liquid.	1.1C	NA0273	II	Explosive 1.1C			62	None	Forbidden	Forbidden		B	5	1E, 7E	
	Propellant explosive, liquid.	1.3C	NA0274	II	Explosive 1.3C			62	None	Forbidden	Forbidden		B	5	1E, 5E	
	Propellant explosive, liquid.	1.1C	NA0474	II	Explosive 1.1C			62	None	Forbidden	Forbidden		B	5	1E, 5E	
	Propellant explosive, liquid.	1.3C	NA0477	II	Explosive 1.3C			62	None	Forbidden	Forbidden		B	5	1E, 5E	
	Release devices, explosive	1.4S	UN0173	II	Explosive 1.4S				62	None	25kg	100kg		A	1, 2	1E, 7E, 9E
	Rivets, explosive	1.4S	UN0174	II	Explosive 1.4S				62	None	25kg	100kg		A	1, 2	1E, 7E, 9E
	Rocket motors	1.3C	UN0186	II	Explosive 1.3C	108		63(d)	62	None	Forbidden	Forbidden		E	5	1E, 7E
	Rocket motors	1.1C	UN0280	II	Explosive 1.1C	108		63(d)	62	None	Forbidden	Forbidden		E	5	1E, 7E
	Rocket motors	1.2C	UN0281	II	Explosive 1.2C	108		63(d)	62	None	Forbidden	Forbidden		E	5	1E, 7E
	Rocket motors, liquid fueled	1.2J	UN0395	II	Explosive 1.2J	108		63(d), 63(e)	62	None	Forbidden	Forbidden		E	5	7E, 14E, 16E
	Rocket motors, liquid fueled	1.3J	UN0396	II	Explosive 1.3J	108		63(d), 63(e)	62	None	Forbidden	Forbidden		E	5	7E, 13E, 16E
	Rocket motors with hypergolic liquids, with or without an expelling charge.	1.3L	UN0250	II	Explosive 1.3L	108		63(d)	62	None	Forbidden	Forbidden		B	5	7E, 14E, 16E
	Rocket motors with hypergolic liquids, with or without an expelling charge.	1.2L	UN0322	II	Explosive 1.2L	108		63(d)		None	Forbidden	Forbidden		B	5	7E, 14E, 16E
	Rockets, line throwing	1.4G	UN0453	II	Explosive 1.4G				62	None	Forbidden	75 kg		E	5	1E, 7E, 9E
	Rockets, line-throwing	1.2G	UN0238	II	Explosive 1.3G				62	None	Forbidden	75 kg		E	5	1E, 7E, 9E
	Rockets, line-throwing	1.3G	UN0240	II	Explosive 1.3G				62	None	Forbidden	Forbidden		E	5	7E, 14E, 16E
	Rockets, liquid fueled with bursting charge.	1.2J	UN0398	II	Explosive 1.2J				62	None	Forbidden	Forbidden		E	5	1E, 7E, 9E
	Rockets, liquid-fueled with bursting charge.	1.1J	UN0397	II	Explosive 1.1J				62	None	Forbidden	Forbidden		E	5	7E, 14E, 16E
	Rockets, with bursting charge	1.1F	UN0180	II	Explosive 1.1E				62	None	Forbidden	Forbidden		E	5	1E, 7E
	Rockets, with bursting charge	1.1E	UN0181	II	Explosive 1.1E				62	None	Forbidden	Forbidden		E	5	1E, 7E
	Rockets, with bursting charge	1.2E	UN0182	II	Explosive 1.2F				62	None	Forbidden	Forbidden		E	5	1E, 7E
	Rockets, with bursting charge	1.2F	UN0295	II	Explosive 1.2F				62	None	Forbidden	Forbidden		E	5	1E, 7E
	Rockets, with expelling charge	1.2C	UN0436	II	Explosive 1.2C				62	None	Forbidden	Forbidden		E	5	1E, 7E
	Rockets, with expelling charge	1.3C	UN0437	II	Explosive 1.3C				62	None	Forbidden	Forbidden		E	5	1E, 7E
	Rockets, with expelling charge	1.4C	UN0438	II	Explosive 1.4C				62	None	Forbidden	75 kg		E	5	1E, 7E
	Rockets, with inert head.	1.3C	UN0183	II	Explosive 1.3C				62	None	Forbidden	Forbidden		A	1, 3	1E, 7E
Signal devices, hand.	1.4G	UN0191	II	Explosive 1.4G				62	None	Forbidden	75kg		A	1, 3	1E, 7E, 9E	
Signal devices, hand.	1.4S	UN0373	II	Explosive 1.4S				62	None	25 kg	100 kg		A	1, 3	1E, 7E, 9E	
Signals, railway track, explosive.	1.1G	UN0192	II	Explosive 1.1G				62	None	Forbidden	Forbidden		B	1, 5	1E, 7E	

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(4) Identification Numbers	(5) Pack- ing group	(6) Labels	(7) Special provisions	(8) Packaging authorizations (§ 173.***)			(9) Quantity limitations		(10) Vessel stowage requirements			
							Excep- tions (8A)	Non- bulk pack- aging (8B)	Bulk packag- ing (8C)	Passenger aircraft or railcar (9A)	Cargo aircraft only (9B)	Cargo vessel (10A)	Pass- enger vessel (10B)	Other storage provisions (10C)	
(1)	Signals, railway track, explosive.....	1.4S	UN0193	II	Explosive 1.4S			62	None	25 kg	100 kg	A	1, 3	1E, 7E	
	Signals, ship distress (other than water-activated contrivances).	1.1G	UN0194	II	Explosive 1.1G			62	None	Forbidden	Forbidden	E	5	1E, 5E, 7E	
	Signals, ship distress (other than water-activated contrivances).	1.3G	UN0195	II	Explosive 1.3G			62	None	Forbidden	75 kg	A	1, 3	1E, 7E, 9E	
	Signals, smoke with explosive sound unit.	1.1G	UN0196	II	Explosive 1.1G			62	None	Forbidden	Forbidden	E	5	1E, 7E, 9E	
	Signals, smoke with explosive sound unit.	1.2G	UN0313	II	Explosive 1.2G			62	None	Forbidden	Forbidden	E	5	1E, 7E, 9E	
	Signals, smoke without explosive sound unit.	1.4G	UN0197	II	Explosive 1.4G			62	None	Forbidden	75kg	A	1, 3	1E, 7E, 9E	
	Sodium dinitro-o-cresolate, dry or wetted with less than 15 percent water, by weight.	1.3C	UN0234	II	Explosive 1.3C			62	None	Forbidden	Forbidden	E	5	1E, 5E	
	Sodium picramate, dry or wetted with less than 20 per cent water, by weight.	1.3C	UN0235	II	Explosive 1.3C			62	None	Forbidden	Forbidden	E	5	1E, 5E	
	Sodium salts of aromatic nitro-de- rivatives, n.o.s., explosive.	1.3C	UN0203	II	Explosive 1.3C			62	None	Forbidden	Forbidden	E	5	1E, 5E	
	Sounding devices, explosive.....	1.2F	UN0204	II	Explosive 1.2F			62	None	Forbidden	Forbidden	E	5	1E, 7E	
	Sounding devices, explosive.....	1.1F	UN0296	II	Explosive 1.1F			62	None	Forbidden	Forbidden	E	5	1E, 7E	
	Sounding devices, explosive.....	1.1D	UN0374	II	Explosive 1.1D			62	None	Forbidden	Forbidden	E	5	1E, 7E	
	Sounding devices, explosive.....	1.2D	UN0375	II	Explosive 1.2D			62	None	Forbidden	Forbidden	E	5	1E, 7E	
	Squibs.....	1.4B	UN0422	II	Explosive 1.4B			62	None	Forbidden	Forbidden	E	5	1E, 7E	
	Squibs.....	1.4G	UN0423						D						
	Squibs, including electric squibs and safety squibs.	1.4S	UN0206												
	Substances, explosive, n.o.s.....	1.1L	UN0357	II	Explosives 1.1L	101		62	None	Forbidden	Forbidden	E	5	12E	
	Substances, explosive, n.o.s.....	1.2L	UN0358	II	Explosive 1.2L	101		62	None	Forbidden	Forbidden	E	5	12E	
	Substances, explosive, n.o.s.....	1.3L	UN0359	II											
	Substances, explosive, n.o.s.....	1.1A	UN0473	II	Explosive 1.1A	101, 111		62	None	Forbidden	Forbidden	B	5	2E, 6E	
	Substances, explosive, n.o.s.....	1.1C	UN0474	II	Explosive 1.1C	101		62	None	Forbidden	Forbidden	B	5	1E, 5E	
Substances, explosive, n.o.s.....	1.1D	UN0475	II	Explosive 1.1D	101		62	None	Forbidden	Forbidden	B	5	1E, 7E		
Substances, explosive, n.o.s.....	1.1G	UN0476	II	Explosive 1.1G	101		62	None	Forbidden	Forbidden	B	5	1E, 5E		
Substances, explosive, n.o.s.....	1.1C	UN0477	II	Explosive 1.1C	101		62	None	Forbidden	Forbidden	B	5	1E, 5E		
Substances, explosive, n.o.s.....	1.3G	UN0478	II	Explosive 1.3G	101		62	None	Forbidden	Forbidden	B	5	1E, 5E, 11E		
Substances, explosive, n.o.s.....	1.4C	UN0479	II	Explosive 1.4C	101		62	None	Forbidden	Forbidden	B	5	1E, 5E		
Substances, explosive, n.o.s.....	1.4D	UN0480	II	Explosive 1.4D	101		62	None	Forbidden	Forbidden	B	5	1E, 7E		
Substances, explosive, n.o.s.....	1.4S	UN0481	II	Explosive 1.4S	101		62	None	25kg	100kg	A	1, 2	1E, 7E, 9E		
Substances, explosive, n.o.s.....	1.5D	UN0482	II	Explosive 1.5D	101		62	None	Forbidden	Forbidden	E	5	1E, 7E		
Substances, explosive, n.o.s.....	1p														
Tetranitroaniline.....	1.1D	UN0207	II	Explosive 1.1D			62	None	Forbidden	Forbidden	Forbidden	B	5	1E, 7E	
Tetrazol-1-acetic acid.....	1.4C	UN0407	II	Explosive 1.4C			62	None	Forbidden	Forbidden	75kg	B	5	1E, 5E	
Torpedoes, liquid fuelled, with inert head.	1.3J	UN0450	II	Explosive 1.3J		63(b)	62	None	Forbidden	Forbidden	Forbidden	E	5	7E, 14, 16E	
Torpedoes, liquid fuelled, with or without bursting charge.	1.1J	UN0449	II	Explosives 1.1J		63B	62	None	Forbidden	Forbidden	Forbidden	E	5	1E, 7E	

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class	Identification numbers	Packaging group	Labels	Special provisions	(8) Packaging authorizations (§ 173.155)			(9) Quantity limitations		(10) Vessel stowage requirements		
							Excep-tions	Non-bulk packag-ing	Bulk packag-ing	Passenger aircraft or railcar	Cargo aircraft only	Cargo vessel	Passenger vessel	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)	(10C)
	Torpedoes with bursting charge	1.1E	UN0329	II	Explosive 1.1E		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Torpedoes with bursting charge	1.1F	UN0330	II	Explosive 1.1F		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 5B
	Torpedoes with bursting charge	1.1D	UN0451	II	Explosive 1.1D		63(b)	62	None	Forbidden	Forbidden	E	5	1E, 7E
	Tracers for ammunition	1.3G	UN0212	II	Explosive 1.3G			62	None	Forbidden	Forbidden	E	5	7E, 14E, 16E
	Tracers for ammunition	1.4G	UN0306	II	Explosive 1.4G			62	None	Forbidden	75kg	A	1, 2	1E, 7E, 20E
	Trinitroaniline	1.1D	UN0153	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 7E, 20E
	Trinitroanisole	1.1D	UN0213	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitrobenzene, dry or wetted with less than 30 percent water, by weight.	1.1D	UN0214	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitrobenzenesulfonic acid	1.1L	UN0386	II	Explosive 1.1L			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitrobenzoic acid, dry or wetted with less than 30 percent water, by weight.	1.1D	UN0215	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitrochlorobenzene; (Picryl chloride)	1.1D	UN0155	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitro-m-cresol	1.1D	UN0216	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitrofluorenone	1.1D	UN0387	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitronaphthalene	1.1D	UN0217	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitrophenetole	1.1D	UN0218	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitrophenol (Picric acid), dry or wetted with less than 30 percent water, by weight.	1.1D	UN0154	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitrophenylmethylnitramine (Trityl)	1.1D	UN0208	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 4E, 10E
	Trinitroresorcinol (Syphnic acid), dry or wetted with less than 20 percent water, by weight, or mixture of alcohol and water.	1.1D	UN0219	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitroresorcinol (Syphnic acid), wetted with not less than 20 percent water, by weight, or mixture of alcohol and water.	1.1D	UN0394	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitrotoluene (TNT) and Trinitrobenzene mixtures or Trinitrotoluene (TNT) and Hexanitrostilbene mixtures.	1.1D	UN0388	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitrotoluene (TNT), dry or wetted with less than 30 percent water, by weight.	1.1D	UN0209	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trinitrotoluene (TNT) mixtures containing Trinitrobenzene and Hexanitrostilbene.	1.1D	UN0389	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Trilonal	1.1D	UN0390	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E
	Urea nitrate, dry or wetted with less than 20 percent water, by weight.	1.1D	UN0220	II	Explosive 1.1D			62	None	Forbidden	Forbidden	B	5	1E, 5E

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(4) Identification numbers	(5) Packing group	(6) Labels	(7) Special provisions	(8) Packaging authorizations (§ 173.173)			(9) Quantity limitations		(10) Vessel stowage requirements		
							Excep- tions (8A)	Non- bulk pack- aging (8B)	Bulk packag- ing (8C)	Passenger aircraft or railer (9A)	Cargo aircraft only (9B)	Cargo vessel (10A)	Pas- senger vessel (10B)	Other stowage provisions (10C)
(1)	Warheads, rocket with burster or expelling charge.	1.4D	UN0370	II	Explosive 1.4D			62	None	Forbidden	75kg	E	5	1E, 7E
	Warheads, rocket with burster or expelling charge.	1.4F	UN0371	II	Explosive 1.4F			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Warheads, rocket with bursting charge.	1.1D	UN0286	II	Explosive 1.1D			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Warheads, rocket with bursting charge.	1.2D	UN0287	II	Explosive 1.2D			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Warheads, rocket with bursting charge.	1.1F	UN0369	II	Explosive 1.1F			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Warheads, torpedo with bursting charge.	1.1D	UN0221	II	Explosive 1.1D			62	None	Forbidden	Forbidden	E	5	1E, 7E
	Zirconium picramate, dry or wetted with less than 20 percent water, by weight.	1.3C	UN0236	II	Explosive 1.3C			62	None	Forbidden	Forbidden	E	5	1E, 5E

7. In § 172.102(c)(1), as proposed at 52 FR 42932 on November 6, 1987, the following special provisions are added to the *Table of special provisions*, in appropriate numerical sequence:

**§ 172.102 Special provisions.**

Code	Special provisions
(c) * * *	
(1) * * *	
101	The name of the particular substance or article must be specified.
102	The articles may be transported as in Division 1.4 Compatibility Group D (1.4D) if all of the conditions specified in § 173.63(a) are met.
105	The word "Agents" may be used instead of "Explosives" when approved by the Director, OHMT.
106	The recognized name of the particular explosive may be specified in addition to the type.
107	The classification of the substance is expected to vary with the particle size.
108	Fireworks must be so constructed and packaged that loose pyrotechnic composition will not be present in packages during transportation.
109	Rocket motors must be nonpropulsive in transportation. A rocket motor to be considered "nonpropulsive" must be capable of unrestrained burning and must not appreciably move in any direction when ignited by any means.
110	Fire extinguisher charges containing 3.2 grams or less of propellant explosives per unit are not subject to the requirements of this subchapter.
111	Explosive substances of Division 1.1 Compatibility Group A (1.1A) are forbidden for transportation if dry or not desensitized, unless incorporated in a device.
112	Cartridges, small arms which have been classed in Division 1.4 Compatibility Group S (1.4S) may be reclassified and offered for transportation as ORM-D material if they are packaged in accordance with § 173.63(f). Cartridges, small arms that may be shipped as ORM-D are limited to: (1) Ammunition for rifle, pistol, or shotgun; (2) Ammunition with inert projectiles or blank ammunition; and, (3) Ammunition not exceeding 50 caliber for rifle or pistol cartridges or 8 gauge for shotgun shells.
113	The sample must be given a tentative approval by an agency or laboratory in accordance with § 173.56.

Code	Special provisions
114	Jet perforating guns, charged, oil well, without detonator may be reclassified to Division 1.4 Compatibility Group D (1.4D) if the following conditions are met: (1) The total weight of the explosive contents of the shaped charges assembled in the guns does not exceed 90.5 kilograms (199.5 pounds) per vehicle; and (2) The guns are packaged in accordance with Packaging Method US073.

7a. Section 172.320 would be added to read as follows:

**§ 172.320 Explosive hazardous materials.**

Except for Class 1 materials (i.e., explosives) offered for transportation in accordance with § 173.56(e) of this subchapter, each package containing Class 1 materials must be marked with the EX-number for each substance, article or device contained therein. However, when more than five different Class 1 materials are packed in the same package, the package need not be marked with more than five of the EX-numbers.

**§ 172.400 [Amended]**

8. In § 172.400, as proposed at 52 FR 42938 on November 6, 1987, the table in paragraph (b) is amended by adding the following entry in numerical sequence "1.6.....EXPLOSIVE 1.6.....172.411".

9. In § 172.405, the introductory text of paragraph (a), as proposed at 52 FR 42939 on November 6, 1987, is revised to read as follows:

**§ 172.405 Authorized label modifications.**

(a) For Class 1, 2, 3, 4, 5, 6, or 8, text indicating the hazard class (for example, "FLAMMABLE LIQUID") is not required on a label when—

9a. In § 172.411, as proposed at 52 FR 42940 on November 6, 1987, the section heading, the introductory text of paragraph (c), and paragraph (d) are revised and, following the EXPLOSIVE 1.5 label, the EXPLOSIVE 1.6 label is added, as follows:

**§ 172.411 EXPLOSIVE 1.1, 1.2, 1.3, 1.4, 1.5 and 1.6 labels.**

(c) Except for size and color, the EXPLOSIVE 1.4, EXPLOSIVE 1.5 and EXPLOSIVE 1.6 must be as follows:

EXPLOSIVE 1.6:



(d) In addition to complying with § 172.407, the background color on the EXPLOSIVE 1.4, EXPLOSIVE 1.5 and EXPLOSIVE 1.6 labels must be orange. The "\*" shall be replaced with the appropriate compatibility group letter. The compatibility group letter must be shown as a capitalized Roman letter measuring at least 12.7mm (0.5 inch) in height. Division numerals must measure at least 30mm (1.2 inches) in height and at least 5mm (0.2 inch) in width.

**§ 172.504 [Amended]**

10. In § 172.504, paragraph (e), as proposed at 52 FR 42944 on November 6, 1987, the entry "1.6..... Explosives 1.6..... 172.525" is added in numerical sequence to Table 2.

10a. Section 172.525 would be redesignated as § 172.526.

11. New § 172.525 would be added to read as follows:

**§ 172.525 EXPLOSIVES 1.6 placard.**

(a) Except for size and color the EXPLOSIVES 1.6 placard must be as follows:



(b) In addition to complying with § 172.519, the background color on the EXPLOSIVES 1.6 placard must be orange. The division numerals, 1.6, must measure at least 63.5mm (2.5 inches) in height. The text, numerals and inner border must be black.

#### PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

12. The authority citation for part 173 would continue to read as follows:

Authority: 49 U.S.C. App. 1803, 1804, 1805, 1808; 49 CFR part 1, unless otherwise noted.

13. In part 173, subpart C would be revised to read as follows:

#### Subpart C—Definitions, Classification and Packaging for Class 1

Sec.

173.50 Class 1—definitions.

173.51 Authorization to offer and transport explosives.

173.52 Classification codes and compatibility groups of explosives.

173.53 Provisions for using old classifications of explosives.

173.54 Forbidden explosives.

173.55 [Reserved]

173.56 New explosives—definition and procedures for classification and approval.

173.57 Acceptance criteria for new explosives.

173.58 Assignment of class and division for new explosives.

173.59 Description of terms for explosives.

173.60 General packaging requirements for explosives.

173.61 Mixed packaging requirements.

173.62 Specific packaging requirements.

173.63 Packaging exceptions.

#### Subpart C—Definitions, Classification and Packaging for Class 1

##### § 173.50 Class 1—definitions.

(a) *Explosive*. For the purpose of this subchapter, an "explosive" means any substance or article, including a device,

which is designed to function by explosion (i.e., an extremely rapid release of gas and heat) or which, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion, unless the substance or article is otherwise classed under the provision of this subchapter.

(b) Explosives in Class 1 are divided into six divisions as follows:

(1) *Division 1.1* consists of explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.

(2) *Division 1.2* consists of explosives that have a projection hazard but not a mass explosion hazard.

(3) *Division 1.3* consists of explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.

(4) *Division 1.4* consists of explosive devices that present a minor explosion hazard. No device in this division may contain more than 25 grams (0.9 ounce) of a detonating material.

(5) *Division 1.5*<sup>1</sup> consists of very insensitive explosives. This division is comprised of substances which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.

(6) *Division 1.6*<sup>2</sup> consists of extremely insensitive articles which do not have a mass explosive hazard. This division is comprised of articles which contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation.

<sup>1</sup> The probability of transition from burning to detonation is greater when large quantities are transported in a vessel.

<sup>2</sup> The risk from articles of Division 1.6 is limited to the explosion of a single article

##### § 173.51 Authorization to offer and transport explosives.

(a) Unless otherwise provided, no person may offer or transport an explosive, unless it has been tested and classed as required by this subpart and approved by the Director, OHMT (See § 173.56 of this subchapter).

(b) Reports of explosive approved by the Department of Defense or the Department of Energy must be filed with, and receipt acknowledged in writing by, the Director, OHMT, prior to such explosives being offered for transportation.

##### § 173.52 Classification codes and compatibility groups of explosives.

(a) The classification code for an explosive, which is assigned by the Director, OHMT in accordance with this subpart, consists of the division number followed by the compatibility group letter. Compatibility group letters are used to specify the controls for the storage and transportation of explosives and to prevent an increase in hazard that might result if certain types of explosives were stored or transported together. Transportation compatibility requirements for carriers are prescribed in §§ 174.81, 175.78, 176.83 and 177.848 of this subchapter for transportation by rail, air, vessel, and public highway, respectively, and storage directly related thereto.

(b) Compatibility groups and classification codes for the various types of explosives are set forth in the following tables. Table 1 sets forth compatibility groups and classification codes for substances and articles described in the first column of the table. Table 2 shows the number of classification codes that are possible within each explosive division. Altogether, there are 35 possible classification codes for explosives.

TABLE 1. CLASSIFICATION CODES

Description of substances or article to be classified	Compatibility Group	Classification code
Primary explosive substance	A	1.1A.
Article containing a primary explosive substance and not containing two or more effective protective features.	B	1.1B, 1.2B, 1.4B.
Propellant explosive substance or other deflagrating explosive substance or article containing such explosive substance.	C	1.1C, 1.2C, 1.3C, 1.4C.



TABLE 1. CLASSIFICATION CODES—Continued

Description of substances or article to be classified	Compatibility Group	Classification code
Secondary detonating explosive substance or black powder or article containing a secondary detonating explosive substance, in each case without means of initiation and without a propelling charge, or article containing a primary explosive substance and containing two or more effective features.	D D1.1D, 1.2D, 1.4D, 1.5D.	
Article containing a secondary detonating explosive substance, without means of initiation, with a propelling charge (other than one containing flammable liquid or hypergolic liquid).	E	1.1E, 1.2E, 1.4E.
Article containing a secondary detonating explosive substance with its means of initiation, with a propelling charge (other than one containing flammable liquid or hypergolic liquid) or without a propelling charge.	F	1.1F, 1.2F, 1.3F, 1.4F
Pyrotechnic substance or article containing a pyrotechnic substance, or article containing both an explosive substance and an illuminating, incendiary, tear-producing or smoke-producing substance (other than a water-activated article or one containing white phosphorus, phosphide or flammable liquid or gel or hypergolic liquid).	G	1.1G, 1.2G, 1.3G, 1.4G.
Article containing both an explosive substance and white phosphorus.	H	1.2H, 1.3H.
Article containing both an explosive substance and flammable liquid or gel.	J	1.1J, 1.2J, 1.3J.
Article containing both an explosive substance and a toxic chemical agent.	K	1.2K, 1.3K.
Explosive substance or article containing an explosive substance and presenting a special risk (e.g., due to water-activation or presence of hypergolic liquids, phosphides or pyrophoric substances) needing isolation of each type.	L	1.1L, 1.2L, 1.3L.
Articles containing only extremely insensitive detonating substances.	N	1.6N.
Substance or article so packed or designed that any hazardous effects arising from accidental functioning are limited to the extent that they do not significantly hinder or prohibit fire fighting or other emergency response efforts in the immediate vicinity of the package.	S	1.4S.

TABLE 2.—SCHEME OF CLASSIFICATION OF EXPLOSIVES, COMBINATION OF HAZARD DIVISION WITH COMPATIBILITY GROUP

Hazard division	Compatibility group													
	A	B	C	D	E	F	G	H	J	K	L	N	S	A-S
1.1	1.1A	1.1B	1.1C	1.1D	1.1E	1.1F	1.1G		1.1J		1.1L			9
1.2		1.2B	1.2C	1.2D	1.2E	1.2F	1.2G	1.2H	1.2J	1.2K	1.2L			10
1.3			1.3C			1.3F	1.3G	1.3H	1.3J	1.3K	1.3L			7
1.4		1.4B	1.4C	1.4D	1.4E	1.4F	1.4G						1.4S	7
1.5				1.5D										1
1.6												1.6N		1
1.1-1.6	1	3	4	4	3	4	4	2	3	2	3	1	1	35

### § 173.53 Provisions for using old classifications of explosives.

Where the classification system in effect prior to January 1, 1991, is referenced in State or local laws, ordinances or regulations not pertaining to the transportation of hazardous materials, the following table may be used to compare old and new hazard class names:

Class name prior to January 1, 1991	Current classification
Class A explosives	Division 1.1.
Class A or Class B explosives	Division 1.2.
Class B explosives	Division 1.3.
Class C explosives	Division 1.4.
Blasting Agents	Division 1.5.
No applicable hazard class	Division 1.6.

### § 173.54 Forbidden explosives.

Unless otherwise provided in this subchapter, the following explosives shall not be offered for transportation or transported:

(a) An explosive that has not been approved in accordance with § 173.56 of this subchapter.

(b) An explosive mixture or device containing a chlorate and also containing:

(1) An ammonium salt, including a substituted ammonium of quaternary ammonium salt; or,

(2) An acidic substance, including a salt of a weak base and a strong acid.

(c) A leaking or damaged package of explosives.

(d) Propellants that are unstable, condemned or deteriorated.

(e) Nitroglycerin, ethylene glycol dinitrate, or other liquid explosives not specifically authorized by this subchapter.

(f) A loaded firearm (except as provided in 14 CFR 108.11).

(g) Fireworks that combine an explosive and a detonator.

(h) Fireworks containing yellow or white phosphorus.

(i) A toy torpedo, the maximum outside dimension of which exceeds

23mm (0.8 inch), or a toy torpedo containing a mixture of potassium chlorate, black antimony (antimony sulfide), and sulfur, if the weight of the explosive material in the device exceeds 0.26 gram (4 grains).

(j) Explosives specifically forbidden in the Hazardous Materials Table in § 172.101 of this subchapter.

(k) Explosives not meeting the acceptance criteria specified in § 173.57 of this subchapter.

### § 173.55 (Reserved)

### § 173.56 New explosives—definition and procedures for classification and approval.

(a) *Definition of new explosive.* For the purposes of this subchapter a "new explosive" means an explosive produced by a person who:

(1) Has not previously produced that explosive; or

(2) Has previously produced that explosive but has made a change in the formulation, design or process so as to alter the properties of the explosive. An explosive will not be considered a "new

explosive" if an agency listed in paragraph (b) of this section has determined, and confirmed in writing to the Director, OHMT, that there are no significant differences in hazard characteristics from the explosive previously approved.

(b) *Examination, classing and approval.* Except as provided in paragraph (j) of this section, no person may offer a new explosive for transportation unless that person has specified to the examining agency the ranges of composition of ingredients and components that will be allowed in that particular material or device, and unless it has been examined, classed, and approved as follows:

(1) A new explosive must be examined and assigned a recommended shipping description, class, and classification code by the Bureau of Explosives (BOE) or the Bureau of Mines, U.S. Department of Interior (BOM). The recommendation of class and classification code must be based on the tests and criteria prescribed in §§ 173.52, 173.57 and 173.58 of this subchapter. Each person who offers for transportation a new explosive must submit a copy of the report of examination and assignment of recommended shipping description, class and classification code to the Director, OHMT, for approval and must receive written approval and an EX-number from the Director, OHMT, before offering that explosive for transportation.

(2) A new explosive made by or under the direction or supervision of a component of the DOD may be examined, classed, and approved by—

(i) The U.S. Army Command Field Safety Activity, Naval Sea Systems Command (SEA-665), or Headquarters U.S. Air Force (HQUSAF; ISC/SEWV), in accordance with the Department of Defense Explosive Hazard Classification Procedures (TB 700-2; NAVSEAINST 8020.8; AFTO 11A-1-47; DLAR 8220.1), dated December 1989; or

(ii) The agencies and procedures specified in paragraph (b)(1) of this section.

(3) A new explosive made by or under the direction or supervision of the Department of Energy (DOE) may be—

(i) Examined by the DOE in accordance with the Explosive Hazard Classification Procedures (TB 700-2, dated December, 1989), and must be classed and approved by DOE; or

(ii) Examined, classed, and approved in accordance with paragraph (b)(1) of this section.

(4) For a material shipped under the description of "ammonium nitrate—fuel oil mixture (ANFO)", the only test

required for classification purposes is the Cap Sensitivity Test (Test Method 5(a), prescribed in the Explosive Test Manual). The test must be performed by an agency listed in paragraph (b)(1), (b)(2), or (b)(3) of this section, the manufacturer, or the shipper. A copy of the test report must be submitted to the Director, OHMT, before the material is offered for transportation, and a copy of the test report must be retained by the shipper for as long as that material is shipped. At a minimum, the test report must contain the name and address of the person or organization conducting the test, date of the test, quantitative description of the mixture, including prill size and porosity, and a description of the test results.

(c) *Filing DOD or DOE approval report.* Each person who offers for transportation a new explosive approved by DOD or DOE must file with, and receipt acknowledged in writing by, the Director, OHMT, a copy of the approval accompanied by a supporting laboratory report or equivalent data, before offering the new explosive for transportation, unless the new explosive is:

(1) Being transported under paragraph (d) or (e) of this section; or

(2) Covered by a national security classification currently in effect.

(d) *Transportation of explosive samples for examination.*

Notwithstanding the requirements of paragraph (b) of this section with regard to the transportation of a new explosive that has not been approved, a person may offer a sample of a new explosive for transportation, by railroad, highway, or vessel from the place where it was produced to an agency identified in paragraph (b) of this section, for examination if—

(1) The new explosive has been assigned a tentative shipping description and class in writing by the testing agency;

(2) The new explosive is packaged as required by this part according to the tentative description and class assigned, unless otherwise specified in writing by the testing agency; and,

(3) The package is labeled as required by this subchapter and the following is marked on the package:

(i) The words "SAMPLE FOR LABORATORY EXAMINATION";

(ii) The net weight of the new explosive; and

(iii) The tentative shipping name and identification number.

(e) Transportation of unapproved explosives for developmental testing. Notwithstanding paragraph (b) of this section, the owner of a new explosive that has not been examined or approved

may transport that new explosive from the place where it was produced to an explosives testing range if—

(1) It is not a primary (initiating) explosive or a forbidden explosive according to this subchapter;

(2) It is described as a Division 1.1 explosive (substance or article) and is packed, marked, labeled, described on shipping papers and is otherwise offered for transportation in conformance with the requirements of this subchapter applicable to Division 1.1;

(3) It is transported in a motor vehicle operated by the owner of the explosive; and

(4) It is accompanied by a person, in addition to the operator of the motor vehicle, who is qualified by training and experience to handle the explosive.

(f) Notwithstanding paragraph (b) or (d) of this section, the Director, OHMT, may approve a new explosive on the basis of an approval issued for the explosive by the competent authority of a foreign government, or when examination of the explosive by the Bureau of Explosives or the Bureau of Mines is impracticable, on the basis of reports of tests conducted by disinterested third parties, or may approve the transportation of an explosives sample for the purpose of examination by the BOE, the BOM, or other government agency.

(g) Notwithstanding paragraph (b) of this section, an explosive may be transported under §§ 171.11, 171.12, or 176.11 of this subchapter without the approval of the Director, OHMT, if the Director, OHMT, has acknowledged, in writing, the acceptability of an approval issued by the competent authority of a foreign government pursuant to the provisions of the UN Recommendations, the ICAO Technical Instructions, the IMDG Code, or other national or international regulations based on the UN Recommendations. In such a case, a copy of the foreign competent authority approval, and a copy of the written acknowledgement of its acceptance must accompany each shipment of that explosive.

(h) The requirements of this section do not apply to small arms ammunition which is:

(1) Not a forbidden explosive under § 173.54 of this subchapter;

(2) Ammunition for rifle, pistol, or shotgun;

(3) Ammunition with inert projectile or blank ammunition; and

(4) Ammunition not exceeding 50 caliber for rifle or pistol cartridges or 6 gauge for shotgun shells.

(i) If experience or other data indicate that the hazard of a material or a device

containing an explosive composition is greater or less than indicated according to the definition and criteria specified in §§ 173.50, 173.56, and 173.58 of this subchapter, the Director, OHMT, may, following examination in accordance with paragraph (b) of this section, revise its classification or except the material or device from the requirements of this subchapter.

(j) *Fireworks.* Notwithstanding the provisions of paragraph (b) of this section, Division 1.3 and 1.4 fireworks may be classed and approved by the Director, OHMT, without prior examination and offered for transportation, if:

(1) The fireworks are manufactured in accordance with the applicable requirements in APA Standard 87-1;

(2) A thermal stability test is conducted on the device by the BOE, the BOM, or the manufacturer. The test must be performed by maintaining the device, or a representative prototype of a large device such as a display shell, at a temperature of 75 °C. (167 °F.) for 48 consecutive hours. When a device contains more than one component, those components which could be in physical contact with each other in the finished device must be placed in contact with each other during the thermal stability test; and

(3) The manufacturer applies in writing to the Director, OHMT, following the applicable requirements in APA Standard 87-1, and is notified in writing by the Director, OHMT, that the fireworks has been classed, approved, and assigned an EX-number. Each application must be complete, including all relevant background data and copies of all applicable drawings, test results, and any other pertinent information on each device for which approval is being requested. The manufacturer must sign the application and certify that the device for which approval is requested conforms to APA Standard 87-1 and that the descriptions and technical information contained in the application are complete and accurate. If the application is denied, the manufacturer will be notified in writing of the reasons for the denial. The Director, OHMT, may require that the fireworks be examined by an agency listed in paragraph (b)(1) of this section.

(Approved by the Office of Management and Budget under Control Number 2137-0557).

#### § 173.57 Acceptance criteria for new explosives.

(a) Unless otherwise excepted, an explosive substance must be subjected to the Drop Weight Impact Sensitivity Test (Test Method 3(a)(i)), the Friction Sensitivity Test (Test Method 3(b)(iii)),

the Thermal Stability Test (Test Method 3(c)) at 75 °C. (167 °F.) and the Small-Scale Burning Test (Test Method 3(d)(i)), each as described in the Explosive Test Manual (UN Recommendations on the Transport of Dangerous Goods, Tests and Criteria, First Edition (see § 171.8 of this subchapter). A substance is forbidden for transportation if any one of the following occurs:

(1) For a liquid, failure to pass the test criteria when tested in the Drop Weight Impact Sensitivity Test apparatus for liquids;

(2) For a solid, failure to pass the test criteria when tested in the Drop Weight Impact Sensitivity Test apparatus for solids;

(3) The substance has a friction sensitiveness equal to or greater than that of dry pentaerythrite tetranitrate (PETN) when tested in the Friction Sensitivity Test;

(4) The substance fails to pass the test criteria specified in the Thermal Stability Test at 75 °C. (167 °F.); or

(5) Explosion occurs when tested in the Small-Scale Burning Test.

(b) An explosive article, packaged or unpackaged, or a packaged explosive substance must be subjected to the Thermal Stability Test for Articles and Packaged Articles (Test method 4(a)(i)) and the Twelve Meter Drop Test (Test Method 4(b)(ii)), when appropriate, in the Explosive Test Manual. An article or packaged substance is forbidden for transportation if evidence of thermal instability or excessive impact sensitivity is found in those tests according to the criteria and methods of assessing results prescribed therein.

(c) Dynamite (explosive, blasting, type A) is forbidden for transportation if any one of the following occurs:

(1) It does not have uniformly mixed with the absorbent material a satisfactory antacid in a quantity sufficient to have the acid neutralizing power of an amount of magnesium carbonate equal to one percent of the nitroglycerin or other liquid explosive ingredient;

(2) During the centrifuge test (Test Method D-2, in Appendix D to this part), or in the compression test (Test Method D-3 in Appendix D to this part), a non-gelatin dynamite loses more than 3 percent by weight of the liquid explosive or a gelatin dynamite loses more than 10 percent by weight of the liquid explosive; or

(3) During the leakage test (Test Method D-1 in Appendix D to this part), there is any loss of liquid.

#### § 173.58 Assignment of class and division for new explosives.

(a) *Division 1.1, 1.2, 1.3, and 1.4 explosives.* In addition to the test prescribed in § 173.57 of this subchapter, a substance or article in these divisions must be subjected to Test Methods 6(a), 6(b), and 6(c), as described in the Explosive Test Manual, for assignment to an appropriate division. The criteria for assignment of class and division are as follows:

(1) Division 1.1 if the major hazard is mass explosion;

(2) Division 1.2 if the major hazard is dangerous projections;

(3) Division 1.3 if the major hazard is radiant heat or violent burning, or both, but there is no blast or projection hazard;

(4) Division 1.4 if there is a small hazard with no mass explosion and no projection of fragments of appreciable size or range;

(5) Division 1.4 Compatibility Group S (1.4S) if the hazardous effects are confined within the package or the blast and projection effects do not significantly hinder emergency response efforts; or

(6) Not in the explosive class if the substance or article does not have significant explosive hazard or if the effects of explosion are completely confined within the article.

(b) *Division 1.5 explosive.* Except for ANFO, a substance that has been previously examined in accordance with the provisions § 173.57(a) of this subchapter, must be subjected to the following additional tests: Cap Sensitivity Test, Princess Incendiary Spark Test, DDT Test, and External Fire Test, each as described in the Explosive Test Manual. A material may not be classed as a Division 1.5 explosive if any of the following occurs:

(1) Detonation occurs in the Cap Sensitivity Test (Test Method 5(a));

(2) Detonation occurs in the DDT Test (Test Method 5(b)(ii));

(3) An explosion, evidenced by a loud noise and projection of fragments, occurs in the External Fire Test (Test Method 5(c)); or

(4) Ignition or explosion occurs in the Princess Incendiary Spark Test (Test Method 5(d)).

(c) *Division 1.6 explosive.* (1) In order to be classed as a 1.6 explosive, an article must pass all of the following tests, as prescribed in the Explosive Test Manual:

- (i) The 1.6 Article External Fire Test;
- (ii) The 1.6 Article Slow Cook-off Test; and
- (iii) The 1.6 Article Propagation Test.

(2) A substance intended for use as the explosive load in an article of Division 1.8 must be an extremely insensitive detonating substance (EIDS). In order to determine if a substance is an EIDS, it must be subjected to the tests in paragraphs (c)(2)(i) through (c)(2)(x) of this section, which are described in the Explosive Test Manual. The substance must be tested in the form (i.e., composition, granulation, density, etc.) in which it is to be used in the article. A substance is not an EIDS (extremely insensitive detonating substance) if it fails any one of the tests described in paragraphs (c)(2)(i) through (c)(2)(x) of this section.

(i) The Drop Weight Impact Sensitivity Test;

(ii) The Friction Sensitivity Test;

(iii) The Thermal Sensitivity Test at 75 °C. (167 °F.);

(iv) The Small Scale Burning Test;

(v) The EIDS Cap Test;

(vi) The EIDS Gap Test;

(vii) The Susan Test;

(viii) The EIDS Bullet Impact Test;

(ix) The EIDS External Fire Test; and

(x) The EIDS Slow Cook-off Test.

(d) The Director, OHMT, may waive or modify certain test(s) identified in §§ 173.57 and 173.58 of this subchapter, or require additional testing, if appropriate. In addition, the Director, OHMT, may limit the quantity of explosive in a device.

(e) Each explosive is assigned a compatibility group letter, by the Director, OHMT, based on the criteria prescribed in § 173.52(b) of this subchapter.

#### § 173.59 Description of terms for explosives.

For the purpose of this subchapter, a description of the following terms is provided for information only. They must not be used for purposes of classification or to replace proper shipping names prescribed in § 172.101 of this subchapter.

**Ammonium-nitrate—fuel oil mixture (ANFO).** A blasting explosive containing no ingredients other than prilled ammonium nitrate and fuel oil.

**Ammunition.** Generic term related mainly to articles of military application consisting of all types of bombs, grenades, rockets, mines, projectiles and other similar devices or contrivances.

**Ammunition, illuminating, with or without burster, expelling charge or propelling charge.** Ammunition designed to produce a single source of intense light for lighting up an area. The term includes illuminating cartridges, grenades and projectiles, and illuminating and target identification bombs. The term excludes the following

articles which are listed separately: *cartridges, signal; signal devices; hand signals; distress flares, aerial and flares, surface.*

**Ammunition, incendiary.** Ammunition containing an incendiary substance which may be a solid, liquid or gel including white phosphorus. Except when the composition is an explosive *per se*, it also contains one or more of the following: a propelling charge with primer and igniter charge, a fuze with burster or expelling charge. The term includes: "Ammunition, incendiary, liquid or gel, with burster, expelling charge or propelling charge";

"Ammunition, incendiary with or without burster, expelling charge or propelling charge"; and "Ammunition, incendiary white phosphorus, with burster, expelling charge or propelling charge".

**Ammunition, practice.** Ammunition without a main bursting charge, containing a burster or expelling charge. Normally it also contains a fuze and propelling charge. The term excludes the following article which is listed separately: "Grenades, practice".

**Ammunition, proof.** Ammunition containing pyrotechnic substance, used to test the performance or strength of new ammunition, weapon component or assemblies.

**Ammunition, smoke.** Ammunition containing a smoke-producing substance such as chlorosulfonic acid mixture (CSAM), titanium tetrachloride (FM), white phosphorus, or smoke producing substance whose composition is based on hexachloroethanol (HC) or red phosphorus. Except when the substance is an explosive *per se*, the ammunition also contains one or more of the following: a propelling charge with primer and igniter charge; a fuze with burster or expelling charge. The term includes: "Ammunition, smoke, with or without burster, expelling charge or propelling charge"; "Ammunition, smoke, white phosphorus with burster, expelling charge or propelling charge".

**Ammunition, tear-producing with burster, expelling charge or propelling charge.** Ammunition containing tear-producing substance. It may also contain one or more of the following: a pyrotechnic substance, a propelling charge with primer and igniter charge, a fuze with burster or expelling charge.

**Ammunition, toxic.** Ammunition containing toxic agent. It may also contain one or more of the following: a pyrotechnic substance, a propelling charge with primer and igniter charge, a fuze with burster or expelling charge.

**Articles, explosive, extremely insensitive (Articles, EEI).** Articles that contain only extremely insensitive

detonating substances and which demonstrate a negligible probability of accidental initiation or propagation under normal conditions of transport and which have passed Test Series 7.

**Articles, pyrophoric.** Articles which contain a pyrophoric substance (capable of spontaneous ignition when exposed to air) and an explosive substance or component. The term excludes articles containing white phosphorus.

**Articles, pyrotechnic for technical purposes.** Articles which contain pyrotechnic substances and are used for technical purposes such as heat generation, gas generation, theatrical effects, etc. The term excludes the following articles which are listed separately: all ammunition; *cartridges, signal; cutters, cable, explosive; fireworks; flares, aerial; flares, surface; release devices, explosives; rivets, explosive; signal devices, hand; signals, distress; signals, railway track, explosive; and signals, smoke.*

**Black powder (gunpowder).** Substance consisting of an intimate mixture of charcoal or other carbon and either potassium or sodium nitrate, and sulphur. It may be meal, granular, compressed, or pelletized.

**Bombs.** Explosive articles which are dropped from aircraft. They may contain a flammable liquid with bursting charge, a photo-flash composition or bursting charge. The term excludes *torpedoes* (aerial) and includes *bombs, photo-flash; bombs with bursting charge; bombs with flammable liquids, with bursting charge.*

**Boosters.** Articles consisting of a charge of detonating explosive without means of initiation. They are used to increase the initiating power of detonators or detonating cord.

**Busters, explosive.** Articles consisting of a small charge of explosive to open projectiles or other ammunition in order to disperse their contents.

**Cartridges, blank.** Articles which consist of a cartridge case with a center or rim fire primer and a confined charge of smokeless or black powder, but no projectile. Used in training, saluting, or in starter pistols, etc.

**Cartridges, flash.** Articles consisting of a casing, a primer and flash powder, all assembled in one piece for firing.

**Cartridges for weapons.** (1) Fixed (assembled) or semi-fixed (partially assembled) ammunition designed to be fired from weapons. Each cartridge includes all the components necessary to function the weapon once. The name and description should be used for military small arms cartridges that cannot be described as "cartridges, small arms". Separate loading

ammunition is included under this name and description when the propelling charge and projectile are packed together (see also "Cartridges, blank").

(2) Incendiary, smoke, toxic, and tear-producing cartridges are described under "ammunition, incendiary", etc.

*Cartridges for weapons, inert projectile.* Ammunition consisting of a casing with propelling charge and a solid or empty projectile.

*Cartridges, oil well.* Articles consisting of a casing of thin fiber, metal or other material containing only propellant explosive. The term excludes "charges, shaped, commercial".

*Cartridges, power device.* Articles designed to accomplish mechanical actions. They consist of a casing with a charge of deflagrating explosive and a means of ignition. The gaseous products of the deflagration produce inflation, linear or rotary motion or activate diaphragms, valves or switches or project fastening devices or extinguishing agents.

*Cartridges, signal.* Articles designed to fire colored flares or other signals from signal pistols or devices.

*Cartridges, small arms.* Ammunition consisting of a cartridge case fitted with a center or rim fire primer and containing both a propelling charge and solid projectile(s). They are designed to be fired in weapons of caliber not larger than 19.1 mm. Shotgun cartridges of any caliber are included in this description. The term excludes: "Cartridges, small arms, blank", and some military small arms cartridges listed under "Cartridges for weapons, inert projectile".

*Cases, cartridge, empty with primer.* Articles consisting of a cartridge case made from metal, plastics or other non-flammable materials, in which only the explosive component is the primer.

*Cases, combustible, empty, without primer.* Articles consisting of cartridge cases made partly or entirely from nitrocellulose.

*Charges, bursting.* Articles consisting of a charge of detonating explosive such as hexolite, octolite, or plastics bonded explosive designed to produce effect by blast or fragmentation.

*Charges, demolition.* Articles consisting of a charge of detonating explosive in a casing of fiberboard, plastics, metal or other material. The term excludes articles identified as "bombs, mines, etc.".

*Charges, depth.* Articles consisting of a charge of detonating explosive contained in a drum or projectile. They are designed to detonate under water.

*Charges, expelling.* A charge of deflagrating explosive designed to eject the payload from the parent article without damage.

*Charges, explosive, commercial without detonator.* Articles consisting of a charge of detonating explosive without means of initiation, used for explosive welding, joining, forming, and other metallurgical processes.

*Charges, propelling.* Articles consisting of propellant charge in any physical form, with or without a casing, for use in cannon or as a component of rocket motors.

*Charges, shaped commercial, without detonator.* Articles consisting of a casing containing a charge of detonating explosive with a cavity lined with rigid material, without means of initiation. They are designed to produce a powerful, penetrating jet effect.

*Charges, shaped, flexible, linear.* Articles consisting of a V-shaped core of a detonating explosive clad by a flexible metal sheath.

*Charges, supplementary, explosive.* Articles consisting of a small removable booster used in the cavity of a projectile between the fuze and the bursting charge.

*Components, explosive train, n.o.s.* Articles containing an explosive designed to transmit a detonation or deflagration within an explosive train.

*Contrivance, water-activated with burster, expelling charge or propelling charge.* Articles whose functioning depends on physico-chemical reaction of their contents with water.

*Cord, detonating, flexible.* Articles consisting of a core of detonating explosive enclosed in spun fabric with plastics or other covering.

*Cord (fuse) detonating, metal clad.* Articles consisting of a core of detonating explosive clad by a soft metal tube with or without protective covering. When the core contains a sufficiently small quantity of explosive, the words "mild effect" are added.

*Cord igniter.* Articles consisting of textile yarns covered with black powder or another fast burning pyrotechnic composition and a flexible protective covering or it consists of a core of black powder surrounded by a flexible woven fabric. It burns progressively along its length with an external flame and is used to transmit ignition from a device to a charge or primer.

*Cutters, cable, explosive.* Articles consisting of a knife-edged device which is driven by a small charge of deflagrating explosive into an anvil.

*Detonator assemblies, non-electric, for blasting.* Non-electric detonators assembled with and activated by such means as safety fuse, shock tube, flash tube, or detonating cord. They may be of instantaneous design or incorporate delay elements. Detonating relays incorporating detonating cord are

included. Other detonating relays are included in "Detonators, non-electric".

*Detonators.* Articles consisting of a small metal or plastic tube containing explosives such as lead azide, PETN, or combinations of explosives. They are designed to start a detonation train. They may be constructed to detonate instantaneously, or may contain a delay element. They may contain no more than 10 grams of total explosives weight, excluding ignition and delay charges, per unit. The term includes: "detonators for ammunition"; "detonators for blasting, both electric and non-electric"; and "detonating relays without flexible detonating cord".

*Dynamite.* A detonating explosive containing a liquid explosive ingredient (generally nitroglycerin or similar organic nitrate esters or both) that is uniformly mixed with an absorbent material, such as wood pulp, and usually contains materials such as nitrocellulose, sodium and ammonium nitrate.

*Entire load and total contents.* The phrase means such a substantial portion of the material explodes that the practical hazard should be assessed by assuming simultaneous explosion of the whole of the explosive content of the load or package.

*Explode.* The term indicates those explosive effects capable of endangering life and property through blast, heat, and projection of missiles. It encompasses both deflagration and detonation.

*Explosion of the total contents.* The phrase is used in testing a single article or package or a small stack of articles or packages.

*Explosive, blasting.* Detonating explosive substances used in mining, construction, and similar tasks. Blasting explosives are assigned to one of five types. In addition to the ingredients listed, blasting explosives may also contain inert components such as kieselguhr and other minor ingredients such as coloring agents and stabilizers.

*Explosive, blasting, type A.* Substances consisting of liquid organic nitrates such as nitroglycerin or a mixture of such ingredients with one or more of the following: Nitrocellulose, ammonium nitrate or other inorganic nitrates, aromatic nitro-derivatives, or combustible materials, such as wood-meal and aluminum powder. Such explosives must be in powdery, gelatinous, plastic or elastic form. The term includes dynamite, blasting gelatine and gelatine dynamites.

*Explosive, blasting, type B.* Substances consisting of a mixture of ammonium nitrate or other inorganic

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nitrites with an explosive such as trinitrotoluene, with or without other substances, such as wood-meal and aluminum powder, or a mixture of ammonium nitrate or other inorganic nitrates with other combustible substances which are not explosive ingredients. Such explosives must not contain nitroglycerin, similar liquid organic nitrates, or chlorates.

**Explosive, blasting, type C.** Substances consisting of a mixture of either potassium or sodium chlorate or potassium, sodium or ammonium perchlorate with organic nitro-derivatives or combustible materials such as wood-meal or aluminum powder or a hydrocarbon. Such explosives must not contain nitroglycerin or similar liquid organic nitrates.

**Explosive, blasting, type D.** Substances consisting of a mixture of organic nitrate compounds and combustible materials such as hydrocarbons and aluminum powder. Such explosives must not contain nitroglycerin, similar liquid organic nitrates, chlorates or ammonium-nitrate. The term generally includes plastic explosives.

**Explosive, blasting, type E.** Substances consisting of water as an essential ingredient and high proportions of ammonium nitrate or other oxidizers, some or all of which are in solution. The other constituents may include nitro-derivatives such as trinitrotoluene, hydrocarbons or aluminum powder. The term includes; explosives, emulsion; explosives, slurry; and explosives, watergel.

**Explosive, deflagrating.** A substance, e.g., propellant, which reacts by deflagration rather than detonation when ignited and used in its normal manner.

**Explosive, detonating.** A substance which reacts by detonation rather than deflagration when initiated and used in its normal manner.

**Explosive, extremely insensitive detonating substance (EIDS).** A substance which, although capable of sustaining a detonation, has demonstrated through tests that it is so insensitive that there is very little probability of accidental initiation.

**Explosive, primary.** Explosive substance manufactured with a view to producing a practical effect by explosion which is very sensitive to heat, impact, or friction and which, even in very small quantities, detonates. The main primary explosives are mercury fulminate, lead azide, and lead styphnate.

**Explosive, secondary.** An explosive substance which is relatively insensitive (when compared to primary explosives) which is usually initiated by primary

explosives with or without the aid of boosters or supplementary charges. Such an explosive may react as a deflagrating or as a detonating explosive.

**Fireworks.** Pyrotechnic articles designed for entertainment.

**Flares.** Articles containing pyrotechnic substances which are designed to illuminate, identify, signal, or warn. The term includes: flares, aerial and flares, surface.

**Flash powder.** Pyrotechnic substance which, when ignited, produces an intense light.

**Fracturing devices, explosive, for oil wells, without detonators.** Articles consisting of a charge of detonating explosive contained in a casing without the means of initiation. They are used to fracture the rock around a drill shaft to assist the flow of crude oil from the rock.

**Fuse/Fuze.** Although these two words have a common origin (French fusee, fusil) and are sometimes considered to be different spellings, it is useful to maintain the convention that fuse refers to a cord-like igniting device, whereas fuze refers to a device used in ammunition which incorporates mechanical, electrical, chemical, or hydrostatic components to initiate a train by deflagration or detonation.

**Fuse, igniter.** Articles consisting of a metal tube with a core of deflagrating explosives.

**Fuse, instantaneous, non detonating (Quickmatch).** Article consisting of cotton yarns impregnated with fine black powder. It burns with an external flame and is used in ignition trains for fireworks, etc.

**Fuse, safety.** Article consisting of a core of fine-grained black powder surrounded by a flexible woven fabric with one or more protective outer coverings. When ignited, it burns at a predetermined rate without any explosive effect.

**Fuzes.** Articles designed to start a detonation or deflagration in ammunition. They incorporate mechanical, electrical, chemical, or hydrostatic components and generally protective features. The term includes: Fuzes, detonating; fuzes detonating with protective features; and fuzes igniting.

**Grenades, hand or rifle.** Articles which are designed to be thrown by hand or to be projected by rifle. The term includes: Grenades, hand or rifle, with bursting charge; and grenades, practice, hand or rifle. The term excludes: Grenades, smoke.

**Igniters.** Articles containing one or more explosive substance used to start deflagration of an explosive train. They may be actuated chemically,

electrically, or mechanically. The term excludes: Cord, igniter; fuse, igniter; fuse, instantaneous, non-detonating; fuze, igniting; lighters, fuse, instantaneous, non-detonating; fuzes, igniting; lighters, fuse; primers, cap type; and primers, tubular.

**Ignition, means of.** A general term used in connection with the method employed to ignite a deflagrating train of explosive or pyrotechnic substances (for example: a primer for propelling charge, an igniter for a rocket motor or an igniting fuze).

**Initiation, means of.** (1) A device intended to cause the detonation of an explosive (for example: detonator, detonator for ammunition, or detonating fuze).

(2) The term "with its own means of initiation" means that the contrivance has its normal initiating device assembled to it and this device is considered to present a significant risk during transport but not one great enough to be unacceptable. The term does not apply, however, to a contrivance packed together with its means of initiation, provided the device is packaged so as to eliminate the risk of causing detonation of the contrivance in the event of functioning of the initiating device. The initiating device can even be assembled in the contrivance provided there are protective features such that the device is very unlikely to cause detonation of the contrivance under conditions which are associated with transport.

(3) For the purposes of classification, any means of initiation without two effective protective features should be regarded as Compatibility Group B; an article with its own means of initiation, without two effective protective features, would be Compatibility Group F. On the other hand, a means of initiation which itself possesses two effective protective features would be Compatibility Group D, and an article with a means of initiation which possesses two effective features would be Compatibility Group D or E. A means of initiation, adjudged as having two effective protective features, must be approved by the Director, OHMT. A common and effective way of achieving the necessary degree of protection is to use a means of initiation which incorporates two or more independent safety features.

**Jet perforating guns, charged, oil well, without detonator.** Articles consisting of a steel tube or metallic strip, into which are inserted shaped charges connected by detonating cord, without means of initiation.

**Lighters, fuse.** Articles of various design actuated by friction, percussion, or electricity and used to ignite safety fuse.

**Mass explosion.** Explosion which affects almost the entire load virtually instantaneously.

**Mines.** Articles consisting normally of metal or composition receptacles and bursting charge. They are designed to be operated by the passage of ships, vehicles, or personnel. The term include "Bangalore torpedoes".

**Powder cake (powder paste).** Substance consisting of nitrocellulose impregnated with not more than 60 percent of nitroglycerin or other liquid organic nitrates or a mixture of these.

**Powder, smokeless.** Substance generally based on nitrocellulose used as propellant. The term includes propellants with a single base (nitrocellulose (NC) alone), those with a double base (such as NC and nitroglycerin (NG)) and those with a triple base (such as NC/NC/nitroguanidine). Cast pressed or bag-charges of smokeless powder are listed under "charges, propelling".

**Primers, cap type.** Articles consisting of a metal or plastic cap containing a small amount of primary explosive mixture that is readily ignited by impact. They serve as igniting elements in small arms cartridges and in percussion primers for propelling charges.

**Primers, tubular.** Articles consisting of a primer for ignition and an auxiliary charge of deflagrating explosive, such as black powder, used to ignite the propelling charge in a cartridge case for cannon, etc.

**Projectiles.** Articles, such as a shell or bullet, which are projected from a cannon or other artillery gun, rifle, or other small arm. They may be inert, with or without tracer, or may contain a burster or expelling charge or bursting charge. The term includes: Projectiles, inert, with tracer; projectiles, with burster or expelling charge; and projectiles, with bursting charge.

**Propellants.** Deflagrating explosive used for propulsion.

**Release devices, explosive.** Articles consisting of a small charge of explosive with means of initiation. They sever rods or links to release equipment quickly.

**Rocket motors.** Articles consisting of a solid, liquid, or hypergolic propellant contained in a cylinder fitted with one or more nozzles. They are designed to propel a rocket or guided missile. The term includes: Rocket motors; rocket motors with hypergolic liquids with or without an expelling charge; and rocket motors, liquid fueled.

**Rockets.** Articles containing a rocket motor and a payload which may be an explosive warhead or other device. The term includes: Guided missiles; rockets, line-throwing; rockets, liquid fueled, with bursting charge; rockets, with bursting charge; rockets, with expelling charge; and rockets, with inert head.

**Signals.** Articles consisting of pyrotechnic substances designed to produce signals by means of sound, flame, or smoke or any combination thereof. The term includes: Signal devices, hand; signals, distress ship; signals, railway track, explosive; signals smoke.

**Sounding devices, explosive.** Articles consisting of a charge of detonating explosive. They are dropped from ships and function when they reach a predetermined depth or the sea bed.

**Substance, explosive, very insensitive (Substance, EVI) N.V.S.** Substances which present a mass explosive hazard but which are so insensitive that there is very little probability of initiation, or of transition from burning to detonation under normal conditions of transport and which have passed test series 5.

**Torpedoes.** Articles containing an explosive or non-explosive propulsion system and designed to be propelled through water. They may contain an inert head or warhead. The term includes: Torpedoes, liquid fueled, with inert head; torpedoes, liquid fueled, with or without bursting charge; and torpedoes, with bursting charge.

**Tracers for ammunition.** Sealed articles containing pyrotechnic substances, designed to reveal the trajectory of a projectile.

**Warheads.** Articles containing detonating explosives, designed to be fitted to a rocket, guided missile, or torpedo. They may contain a burster or expelling charge or bursting charge. The term includes: Warhead rocket with bursting charge; and warheads, torpedo, with bursting charge.

#### § 173.60 General packaging requirements for explosives.

(a) Unless otherwise provided in this subpart, the packaging used for explosives (Class 1) must meet Packing Group II requirements. Each packaging used for an explosive must be capable of meeting the test requirements of subpart M of part 178 of this subchapter, at the specified level of performance, and the applicable general packaging requirements of paragraph (b) of this section.

(b) The general requirements for packaging of explosives are as follows:

(1) Nails, staples, and other closure devices, made of metal, having no

protective covering may not penetrate to the inside of the outer packaging unless the inner packaging adequately protects the explosive against contact with the metal.

(2) The closure device of containers for liquid explosives must provide double protection against leakage, such as a screw cap secured in place with tape.

(3) Inner packagings, fitting, and cushioning materials, and the placing of explosive substances or articles in packages, must be such that no dangerous movement may occur within the packages during transportation.

(4) When the packaging includes water that could freeze during transportation, a sufficient amount of anti-freeze, such as denatured ethyl alcohol, must be added to the water to prevent freezing. Anti-freeze that could create a fire hazard because of excessive volatility or excessive concentration may not be used.

(5) Each article fitted with a means of ignition or initiation must be effectively protected from accidental operation during normal conditions of transportation.

(6) For a metal packaging that is double seamed, entry of an explosive substances into the recesses of the seams must be prevented.

(7) The closure device of each metal packaging must include a suitable gasket. The closure device may not include a screw thread.

(8) If a metal-lined box is used for packaging an explosive substance, the box must be constructed in such a way that the explosive substance carried cannot get between the liner and the sides or bottom of the box.

(9) Whenever a box of ordinary natural wood is specified, plywood or reconstituted wood may be substituted for that material, if it is compatible with the explosive carried and is in compliance with the appropriate specification, if any.

(10) An explosive article containing an electrical means of initiation that is sensitive to external electromagnetic radiation, must have its means of initiation effectively protected from electromagnetic radiation sources (for example, radar or radio transmitters) through either design of packaging or the article, or both.

(11) If a plastic bag or plastic container is used in direct contact with the explosive, only those types of plastic may be used that:

(i) Will not build up an electrostatic charge which would lead to ignition of the explosive; and



## EXPLOSIVES TABLE—Continued

methods (e.g., US032) which must be used to pack a particular methods in paragraph (c) of this section defines the packaging methods.

## EXPLOSIVES TABLE

Identification No.	Packaging methods
(1)	(2)
UN0004	US002
UN0005	US032
UN0006	US032
UN0007	US032
UN0009	US023
UN0010	US023
UN0012	US032
UN0014	US032
UN0015	US023
UN0016	US023
UN0018	US023
UN0019	US023
UN0020	US023
UN0021	US023
UN0027	US004
UN0028	US005
UN0029	US027
UN0030	US026
UN0033	US029
UN0034	US029
UN0035	US029
UN0037	US029
UN0038	US029
UN0039	US030
UN0042	US031
UN0043	US059
UN0044	US037
UN0048	US035
UN0049	US035
UN0050	US035
UN0054	US036
UN0055	US029
UN0056	US040
UN0059	US042
UN0060	US044
UN0065	US048
UN0066	US047
UN0070	US006
UN0072	US048
UN0073	US003
UN0074	US024
UN0075	US002
UN0076	US002
UN0077	US002
UN0078	US010
UN0079	US007
UN0081	US009
UN0082	US010
UN0083	US051
UN0084	US051
UN0092	US017
UN0093	US052
UN0094	US053
UN0099	US045
UN0101	US053
UN0102	US045
UN0103	US054
UN0104	US055
UN0105	US055
UN0106	US056
UN0107	US003
UN0110	US003
UN0113	US012
UN0114	US057
UN0118	US073
UN0121	US003
UN0124	US003
UN0129	US003
UN0130	US058
UN0131	US002
UN0132	US002

Identification No.	Packaging methods
(1)	(2)
UN0133	US003
UN0135	US003
UN0136	US029
UN0137	US029
UN0138	US029
UN0143	US024
UN0144	US014
UN0146	US016
UN0147	US002
UN0150	US003
UN0151	US012
UN0153	US002
UN0154	US002
UN0155	US018
UN0158	US016
UN0159	US019
UN0160	US019
UN0161	US029
UN0167	US029
UN0168	US029
UN0169	US023
UN0171	US061
UN0173	US061
UN0174	US062
UN0180	US062
UN0181	US062
UN0182	US062
UN0183	US063
UN0186	US072
UN0190	US067
UN0191	US068
UN0192	US068
UN0193	US067
UN0194	US067
UN0195	US067
UN0196	US067
UN0197	US067
UN0203	US018
UN0204	US069
UN0207	US002
UN0208	US010
UN0209	US022
UN0212	US070
UN0213	US002
UN0214	US010
UN0215	US002
UN0216	US002
UN0217	US002
UN0218	US002
UN0219	US002
UN0220	US029
UN0221	US001
UN0222	US001
UN0223	US003
UN0224	US006
UN0226	US002
UN0234	US002
UN0235	US002
UN0236	US041
UN0237	US065
UN0238	US065
UN0240	US007
UN0241	US039
UN0242	US023
UN0243	US023
UN0244	US023
UN0245	US023
UN0246	US023
UN0247	US043
UN0248	US043
UN0249	US066
UN0250	US023
UN0254	US026
UN0255	US055
UN0257	US012
UN0266	US012
UN0267	US027

(ii) Will not be deteriorated by or react dangerously with the explosive.

(12) A metal surface that could increase the sensitivity or decrease the thermal stability of an explosive may not be in contact with that explosive.

(13) An explosive must be in a waterproof receptacle if:

- It is water soluble;
- It has water or a water solution as part of its composition; or
- It has water or a water solution added to it when offered for transportation.

(14) When this subpart requires a specified percentage of desensitizer or phlegmatizer to be mixed with an explosive, the percentage is based on the total weight of the mixture, not the weight of the explosive alone. When a percentage of water is specified and anti-freeze must be added in accordance with paragraph (a)(4) of this section, the combined weight of the water and the anti-freeze may be substituted for the weight of water required.

## § 173.61 Mixed packaging requirements.

(a) Unless specifically authorized in this subchapter, explosives may not be packed in the same outside packaging with any other material, unless packaged by the DOD in accordance with § 173.7(a) of this subchapter.

(b) Hardware necessary for assembly of explosive articles at the point-of-use may be packed in the same outside packaging with the explosive articles. The hardware must be securely packed in a separate inside packaging. Sufficient cushioning materials shall be used to ensure that all inside packagings are securely packed in the outside packaging.

## § 173.62 Specific packaging requirements.

(a) When the Hazardous Materials Table in § 172.101 of this subchapter, specifies that an explosive must be packaged in accordance with this section, only non-bulk packagings which conform to the provisions of this section, and the applicable requirements in §§ 173.60 and 173.61 of this subchapter, may be used.

(b) *Explosives Table:* The Explosives Table specifies, by a two step process, which packaging methods shall be utilized for a particular proper shipping names. Proper shipping names are identified by their identification number, obtained from column 4 of the Hazardous Materials, § 172.101 of this subchapter, in the first column of the Explosives Table. The second column of which must be used to pack a particular explosive. The table of packaging methods in paragraph (c) of this section defines the packaging method or



EXPLOSIVES TABLE—Continued

Identification No. (1)	Packaging methods (2)
UN0271	US019
UN0272	US019
UN0273	US019
UN0274	US019
UN0275	US034
UN0276	US034
UN0277	US033
UN0278	US033
UN0279	US039
UN0280	US063
UN0281	US063
UN0282	US015
UN0283	US030
UN0284	US056
UN0285	US056
UN0286	US029
UN0287	US029
UN0288	US041
UN0289	US044
UN0290	US045
UN0291	US029
UN0292	US056
UN0293	US056
UN0294	US029
UN0295	US062
UN0296	US069
UN0297	US023
UN0299	US029
UN0300	US023
UN0301	US023
UN0303	US023
UN0305	US017
UN0306	US071
UN0312	US035
UN0313	US067
UN0314	US057
UN0315	US057
UN0316	US057
UN0318	US055
UN0319	US056
UN0320	US060
UN0321	US032
UN0322	US066
UN0323	US034
UN0324	US029
UN0325	US057
UN0326	US032
UN0327	US032
UN0328	US032
UN0329	US064
UN0330	US064
UN0331	US007, US008
UN0332	US011
UN0333	US049
UN0334	US050
UN0335	US025
UN0336	US025
UN0337	US002
UN0338	US002
UN0339	US032
UN0340	US072
UN0341	US072
UN0342	US013
UN0343	US013
UN0344	US029
UN0345	US029
UN0346	US029
UN0347	US029
UN0348	US033
UN0349	US072
UN0350	US072
UN0351	US072
UN0352	US072
UN0353	US072
UN0354	US072

EXPLOSIVES TABLE—Continued

Identification No. (1)	Packaging methods (2)
UN0355	US072
UN0356	US072
UN0357	US072
UN0358	US072
UN0360	US028
UN0361	US028
UN0362	US023
UN0363	US023
UN0364	US048
UN0365	US048
UN0366	US048
UN0367	US055
UN0368	US055
UN0369	US029
UN0370	US029
UN0371	US029
UN0372	US056
UN0373	US067
UN0374	US069
UN0375	US069
UN0376	US060
UN0377	US059
UN0378	US059
UN0379	US036
UN0380	US072
UN0381	US034
UN0382	US072
UN0383	US072
UN0384	US072
UN0385	US002
UN0386	US002
UN0387	US002
UN0388	US002
UN0389	US002
UN0391	US006
UN0392	US010
UN0393	US012
UN0394	US020
UN0395	US072
UN0396	US072
UN0397	US072
UN0398	US072
UN0399	US072
UN0400	US072
UN0401	US002
UN0402	US002
UN0403	US051
UN0404	US051
UN0405	US035
UN0406	US021
UN0407	US021
UN0408	US065
UN0409	US055
UN0410	US055
UN0412	US032
UN0413	US032
UN0414	US039
UN0415	US019
UN0416	US019
UN0417	US032
UN0418	US051
UN0419	US051
UN0420	US051
UN0421	US051
UN0424	US029
UN0425	US029
UN0426	US029
UN0427	US029
UN0428	US031
UN0429	US031
UN0430	US052
UN0431	US052
UN0432	US052
UN0433	US002
UN0434	US029
UN0435	US029
UN0436	US062

EXPLOSIVES TABLE—Continued

Identification No. (1)	Packaging methods (2)
UN0437	US062
UN0438	US062
UN0439	US040
UN0440	US040
UN0441	US040
UN0442	US070
UN0443	US070
UN0444	US070
UN0445	US070
UN0446	US036
UN0447	US036
UN0448	US021
UN0449	US064
UN0450	US064
UN0451	US064
UN0452	US056
UN0453	US065
UN0454	US057
UN0455	US027
UN0456	US026
UN0457	US071
UN0458	US071
UN0459	US071
UN0460	US071
UN0461	US072
UN0462	US072
UN0463	US072
UN0464	US072
UN0465	US072
UN0466	US072
UN0467	US072
UN0468	US072
UN0469	US072
UN0470	US072
UN0471	US072
UN0472	US072
UN0473	US072
UN0474	US072
UN0475	US072
UN0476	US072
UN0477	US072
UN0478	US072
UN0479	US072
UN0480	US072
UN0481	US072
UN0482	US072
UN0484	US006
NA0124	US073
NA0331	US011
NA0411	US003
NA0473	US003

(c) Table of packaging methods: Packaging methods must be utilized in accordance with the following table.

(1) The first column lists, in alphanumeric sequence, the packaging methods prescribed for explosives according to the Explosives Table of paragraph (b) of this section with corresponding UN packaging method identifier in parentheses. If more than one set of packagings are authorized for a packaging method, it is noted with designations (a), (b), (i), (ii), etc.

(2) The second column specifies the inner packagings that are required. If inner packagings are not required, a notation of "Not necessary" or "Optional" appears in the column. The terms "Optional" and "Not necessary"

mean, at the shipper's choice a suitable inner packaging may be used, though not required. If intermediate packagings are required, it is so noted in this column. In addition, any special requirements regarding the inner packagings are specified with a "Note".

(3) The third column specifies the outer packagings which are permitted. If

inner packagings and/or intermediate packagings are specified in the second column, then the packaging specified in the third column must be used as the outer packaging of a combination packaging; otherwise it may be used as a single packaging. Any special requirements regarding the outer packagings are specified with a "Note".

(4) The fourth column specifies, by numerical sequence, particular requirements or exceptions, if applicable. The exception or requirement associated with a particular number is explained in paragraph (d) of this section.

TABLE OF PACKAGING METHODS

(1)	(2)	(3)	(4)
US001 (UN-E1)(a)	Not necessary	Bags: Paper, multiwall, water resistant (5M2) Textile, silt-proof (5L2) Textile, water resistant (5L3) Plastic, woven, silt-proof (5H2) Plastic, woven, water resistant (5H3) Plastic, film (5H4) Barrels: Wood, removable head (2C2)	
US001 (UN-E1)(b)	Bags: Paper, Kraft Plastic Sheets: Plastic	Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Steel, removable head (1A2) Barrels: Wood, removable head (2C2)	
US002 (UN-E2)	Receptacles: Metal, Paper, Plastic, Sheets: Plastic	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G) <i>Note:</i> Removable head plastic drums (1H2) are authorized for UN0219	1 for all entries. 2 for all entries except UN0402.
UN003 (UN-E3)	Bags: Plastic, Rubber, Textile, Rubberized textile <i>Intermediate</i> Bags: Plastic, Rubber, Textile, Rubberized textile Barrels: Wood Receptacles: Plastic	Barrels: Wood, removable head (2C2) Drums: Plastic, removable head (1H2) Steel, removable head (1A2) <i>Note:</i> Coatings other than lead are authorized for steel drums (1A2) Barrels: Wood, removable head (2C2)	3, 4, 6.
US004 (UN-E4)(a)	Receptacles: Fiberboard, Metal, Paper, Plastic, Rubberized textile	Boxes: Fiberboard (4G) Wood, silt-proof (4C2) Plywood (4D) Reconstituted wood (4F) Drums: Aluminum, removable head (1B2) Fiber (1G) Steel, removable head (1A2) <i>Note:</i> steel drums (1A2) must be dust tight	
US004 (UN-E4)(b)	Optional	Boxes: Fiberboard (4G) Wood, silt-proof (4C2) Plywood (4D) Reconstituted wood (4F) Drums: Aluminum, removable head (1B2) Fiber (1G) Steel, removable head (1A2) <i>Note:</i> steel drums (1A2) must be dust tight	
US005 (UN-E5)	Bags: Plastic Sheets: Paper, Kraft Paper, waxed	Boxes: Fiberboard (4G) Wood, silt-proof (4C2) Plywood (4D) Reconstituted wood (4F) Barrels: Wood, removable head (2C2)	
US006 (UN-E6)(a)(i)	<i>For wetted explosives:</i> Bags: Plastic, Rubberized, textile	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Steel, removable head (1A2) Fiber (1G)	
US006 (UN-E6)(a)(ii)	<i>For wetted explosives:</i> Bags: Rubber, Textile, Rubberized textile, <i>Intermediate:</i> Bags: Rubber, Rubberized textile	Barrels: Wood, removable head (2C2) Drums: Steel, removable head (1A2) Fiber (1G)	
US006 (UN-E6)(b)	<i>For desensitized explosives:</i> Same as for wetted explosives except that any fiberboard boxes may be used as inner packaging, and any textile bags as intermediate packaging	<i>For desensitized explosives:</i> Same as for wetted explosives except that any fiberboard boxes may be used as inner packagings and any textile bags as intermediate packaging	
US007 (UN-E8)	Receptacles: Waterproof material Sheets: Waterproof	Barrels: Wood, removable head (2C2) Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G)	5.

TABLE OF PACKAGING METHODS—Continued

(1)	(2)	(3)	(4)
US008 (UN-E9).....	Bags: Oil-resistant Sheets: Plastic Cans: Metal	Bags: Paper, multiwall water resistant (5M2) Textile, sift-proof (5L2) Textile, water resistant (5L3) Woven plastic, without inner lining or coating (5H1) Woven plastic, sift-proof (5H2) Woven plastic, water resistant (5H3) Plastic film (5H4) Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Drums: Fiber (1G) Steel, removable head (1A2) <i>Note: If bags of 5H2, 5H3, or 5H4 are used, no inner packaging necessary.</i> Barrels: Wood, removable head (2C2) Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Barrels: Wood, removable head (2C2) Boxes: Wood, ordinary (4C1) Fiberboard (4G) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G) Bags: Paper, multiwall, water resistant (5M2) Woven plastic, without inner lining or coating (5H1) Woven plastic, sift proof (5H2) Woven plastic, water resistant (5H3) Plastic film (5H4) Textile, sift-proof (5L2) Textile, water resistant (5L3) Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G) Steel, removable head (1A2) <i>Note: If bags of 5H2 or 5H3 are used, no inner packaging is necessary.</i> Barrels: Wood, removable head (2C2) Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G) Barrels: Wood, removable head (2C2) Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G) Aluminum, removable head (1B2) Steel, removable head (1A2) Barrels: Wood removable head (2C2) Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Fiberboard (4G) Drums: Fiber (1G) Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F)	5.
US009 (UN-E10).....	Bags: Waxed paper, Plastic, Rubberized textile	Barrels: Wood, removable head (2C2) Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Barrels: Wood, removable head (2C2) Boxes: Wood, ordinary (4C1) Fiberboard (4G) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G)	
US010 (UN-E11).....	Bags: Waxed paper, Plastic, Rubberized textile Sheets: Waxed paper, Plastic, Textile, Rubberized textile	Boxes: Wood, ordinary (4C1) Fiberboard (4G) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G)	
US011 (UN-E12)....	Bags: Oil-resistant Sheets: Plastic	Bags: Paper, multiwall, water resistant (5M2) Woven plastic, without inner lining or coating (5H1) Woven plastic, sift proof (5H2) Woven plastic, water resistant (5H3) Plastic film (5H4) Textile, sift-proof (5L2) Textile, water resistant (5L3) Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G) Steel, removable head (1A2) <i>Note: If bags of 5H2 or 5H3 are used, no inner packaging is necessary.</i> Barrels: Wood, removable head (2C2) Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G)	
US012 (UN-E13) (a).	<i>For wetted explosives</i> Bags: Plastic Sheets: Plastic	Barrels: Wood, removable head (2C2) Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G) Barrels: Wood, removable head (2C2) Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G)	
US012 (UN-E13) (b).	<i>For dry explosives</i> Bags: Paper, Plastic Boxes: Fiberboard Sheets: Plastic	Barrels: Wood, removable head (2C2) Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G)	
US013 (UN-E15) (a).	Not necessary	Drums: Fiber (1G)	
US013 (UN-E15) (b).	Bags: Waterproof paper, Plastic, Rubberized textile Sheets: Plastic, Rubberized textile	Aluminum, removable head (1B2) Steel, removable head (1A2) Barrels: Wood removable head (2C2) Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Fiberboard (4G) Drums: Fiber (1G) Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F)	
US014 (UN-E17)....	Cans: Metal Receptacles: Glass, Plastic	Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F)	

TABLE OF PACKAGING METHODS—Continued

(1)	(2)	(3)	(4)
US015 (UN-E18).....	Bags: Paper, Plastic Sheets: Plastic	Barrels: Wood, removable head (2C2) Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G) Plywood (1D) Steel, removable head (1A2) Drums: Aluminum, removable head (1B2) Steel, removable head (1A2) Plastic, removable head (1H2) Barrels: Wood, removable head (1B2) Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G)	
US016 (UN-E19) (a).	Not necessary	Drums: Aluminum, removable head (1B2) Steel, removable head (1A2) Plastic, removable head (1H2)	7.
US016 (UN-E19) (b).	Bags: Plastic Sheets: Plastic	Barrels: Wood, removable head (1B2) Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G)	
US017 (UN-E20).....	Receptacles: Metal, Plastic, Wood	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner-liner or coating (4A2) Drums: Fiber (1G)	53.
US018 (UN-E21).....	Boxes: Fiberboard Cans: Metal Receptacles: Waterproof paper, Plastic <i>Note: Plastic used must not be liable to generate static electricity by contained substances</i>	Drums: Fiber (1G) Boxes: Wood, sift-proof (4C2) Plywood (4D) Reconstituted wood (4F)	
US019 (UN-E22) (a).	Bags: Paper, Kraft, Plastic, Textile, Rubberized textile	Barrels: Wood, removable head (2C2) Boxes: Fiberboard (4G) Wood, ordinary (4C1) Wood, sift-proof (4C2) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G) Plywood (1D)	
US019 (UN-E22) (b).	Receptacles: Fiberboard, Metal, Plastic	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Wood, sift-proof (4C2) Plywood (4D) Reconstituted wood (4F)	10.
US019 (UN-E22) (c).	Not necessary	Drums: Steel, removable head (1A2) Fiber (1G) Plywood (1D) Jerrycans: Steel (3A1) Steel, removable head (3A2) Boxes: Fiberboard (4G)	8, 9, 10.
US020 (UN-E24) (a).	Bags: Rubber, Rubberized textile, Plastic	Drums: Steel, removable head (1A2) with coating other than lead	
US020 (UN-E24) (b).	Bags: Rubber, Rubberized textile, Plastic <i>Intermediate</i>		
US021 (UN-E25).....	Bags: Rubber, Rubberized textile, Plastic	Drums: Fiber (1G)	
US021 (UN-E25).....	Bags: Plastic	Barrels: Wood, removable head (2C2)	51.
US022 (UN-E26).....	Bags: Plastic	Boxes:	
US022 (UN-E26).....	Sheets: Plastic	Fiberboard (4G)	
US022 (UN-E26).....	Receptacles: Metal, Paper, Plastic	Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G)	
US022 (UN-E26).....		Bags: Plastic, sift-proof (5H2)	
US023 (UN-E102)...	Optional	Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1) Steel, with inner liner or coating (4A2) Fiberboard (4G) Crates: (For large articles) Drums: Steel, removable head (1A2) Fiber (1G)	13, 14, 16, 47

TABLE OF PACKAGING METHODS—Continued

(1)	(2)	(3)	(4)
US024.....	Cans: Metal Receptacles: Glass, Plastic	Boxes: Wood, ordinary (4C1) <i>Note:</i> DOT Spec. MC-200, motor vehicle container may be used as the outer packaging.	
US025.....	Optional	Boxes: Fiberboard (4G) Plywood (4D) Reconstituted wood (4F) Wood, sift-proof (4C2) <i>Note:</i> Wood boxes (4C1) may be used if the fireworks are packed in fiberboard box inner packagings.	
US026 (UN-E104) ..	Receptacles: Fiberboard, Metal, Paper	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2)	5, 15, 16, 17, 18, 19, 20.
US027 (UN-E105) ..	Receptacles: Fiberboard, Metal, Plastic <i>Intermediate:</i> Boxes: Fiberboard, Wood Sheets: Paper, Kraft, Plastic	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2)	5, 15, 16, 17, 18, 19, 20, 21, 22, 52.
US028 (UN-E105A).	Receptacles: Fiberboard, Metal, Paper	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2)	5, 15, 16, 17, 18, 20, 24, 25, 26, 27.
US029 (UN-E106) ..	Not necessary	Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1) Cradles Crates	14 & 16 for all entries 48 for all entries except UN0434 and UN0435.
US030 (UN-E107)(a).	Not necessary <i>Note:</i> This packaging method is to be used for boosters which are finished articles consisting of closed metal, plastic, or fiberboard receptacles that contain a detonating explosive, or consisting of a plastic-bonded detonating explosive	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) <i>Note:</i> This packaging method is to be used for boosters which are finished articles consisting of closed metal, plastic, or fiberboard receptacles that contain a detonating explosive, or consisting of a plastic-bonded, detonating explosive	
US030 (UN-E107)(b).	Receptacles: Fiberboard, Metal, Plastic Sheets: Plastic, Paper <i>Note:</i> This packaging method is to be used for cast or pressed boosters in tube or capsules without end closures.	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) <i>Note:</i> This packaging method is to be used for cast or pressed boosters in tube or capsules without end closures.	
US031 (UN-E109) ..	Receptacles: Metal, Plastic, Wood	Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2)	16, 28
US032 (UN-E112) ..	Boxes: Fiberboard, Metal, Plastic, Wood <i>Note:</i> Metal clips or dividing partitions in the outer packaging may be used in place of inner packaging	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1) Steel, with inner liner or coating (4A2) Drums: steel, removable head (1A2)	13, 14.
US033 (UN-E113) ..	Receptacles: Fiberboard, Plastic, Metal	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F)	14.
US034 (UN-E114) ..	Receptacles: Fiberboard, Plastic, Metal, Wood	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2)	14 for entries of UN0275, UN0276, and UN0381.

TABLE OF PACKAGING METHODS—Continued

(1)	(2)	(3)	(4)
US035 (UN-E115)	Receptacles: Fiberboard, Metal, Paper, Kraft (for cartridge of 1.4G and 1.4S) Plastic, Wood	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2)	
US036 (UN-E116)	Bags: Plastic, Textile Boxes: Fiberboard, Plastic, Wood <i>Note:</i> (1) Bags are authorized for small cases only. (2) Dividing partitions in the outer packaging may be used in place of inner packagings	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1)	14
US037 (UN-E117)	Boxes: Fiberboard, Metal, Plastic, Wood Cans: Metal	Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2) Cradles, Crates	14, 50. 14, 50.
US038	Not necessary	Boxes: Wood, ordinary (4C1) Wood, sift-proof (4C2) Plywood (4D) Reconstituted wood (4F) Steel (4A1) Steel, with inner liner or coating (4A2) Drums: Steel, removable head (1A2) <i>Note:</i> Packaging 4C1 is authorized for cased charges only	29, 30.
US039 (UN-E119)	Not necessary	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1) Steel, with inner liner or coating (4A2)	31.
US040 (UN-E120)	Tubes: Fiberboard, Other materials <i>Notes:</i> Dividing partitions in the outer packaging may be used in place of inner packagings.	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2)	14.
US041 (UN-E121)	Not necessary	Boxes: Fiberboard (4C1) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2)	15, 16, 34, 50.
US042 (UN-E122)	Boxes: Metal, Plastic, Wood, Fiberboard	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2)	14, 32, 54.
US043 (UN-E123)	Receptacles: Fiberboard, Metal <i>Note:</i> Dividing partitions in the outer packaging may be used in place of inner packagings.	Boxes: Wood, ordinary (4C1), with metal liner Plywood (4D) Reconstituted wood (4F) Steel (4A1)	33.
US044 (UN-E124)	Optional	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted (4F)	14.
US0045 (UN-E125)	Bags: Plastic Sheets: Paper, Kraft, Plastic <i>Note:</i> Reels may be used in place of inner packagings	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F)	14.
US046 (UN-E126)	Receptacles: Fiberboard <i>Note:</i> Reels may be used in place of inner packagings	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F)	14.
US047 (UN-3127)	Receptacles: Fiberboard	Boxes: Wood, ordinary (C1) Steel, with inner liner or coating (4A2)	16, 23, 35.
US048 (UN-E128)	Boxes: Fiberboard, Plastic, Wood Trays: Fiberboard, Plastic, Wood Cans: Metal <i>Note:</i> All inner packagings must be fitted with dividing partitions	Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1)	14, 16, 36
US048 (UN-E129)	Receptacles: Fiberboard, Plastic Sheets: Paper	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Drums: Fibert (1G)	

TABLE OF PACKAGING METHODS—Continued

(1)	(2)	(3)	(4)
US050 (UN-E130)	Receptacles: Fiberboard, Plastic Sheets: Paper	Boxes: Fiberboard (4G) Wood, ordinary (4C1), Plywood (4D) Reconstituted wood (4F) Drums: Fiber (1G)	14
US051 (UN-E133)	Receptacles: Fiberboard, Metal, Plastic Sheets: Paper, Kraft <i>Note:</i> Dividing partitions in the outer package may be used in place of inner packagings	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1) Solid plastics (4H2) Drums: Fiber (1G) Plastic, removable head (1H2)	14
US052 (UN-E134)	Receptacles: Fiberboard, Metal, Plastic, Wood	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1)	14
US053 (UN-E135)	Bags: Plastic, Reels Sheets: Paper, Kraft, Plastic	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F)	
US054 (UN-E136)	Not necessary	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2) Drums: Fiber (1G)	31
US055 (UN-E137)	Receptacles: Fiberboard, Metal, Plastic, Wood Trays: Plastic, Wood <i>Note:</i> Dividing partitions in the outer packaging may be used in place of inner packagings	Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A2)	14, 16, 37
US056 (UN-E138)	Optional	Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1)	14, 16
US057 (UN-E139)	Receptacles: Metal, Plastic, Wood	Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel with inner liner or coating (4A2)	14, 16 for all entries; 28 for UN0121 only
US058 (UN141)	Receptacles: Fiberboard, Metal, Wood Sheets: Paper Trays: Plastic	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2)	
US059 (UN-E142)	Boxes: Fiberboard, Metal, Plastic, Wood Cans: Metal Trays: Fiberboard, sleeved, Plastic, sleeved <i>Intermediate:</i> (Optional with inner boxes but mandatory with trays.)	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2)	5, 38, 39, 40
US060 (UN-E143)	Boxes: Fiberboard Boxes: Fiberboard, Metal, Wood Tubes: Fiberboard Trays: Plastic	Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1)	14, 16
US061 (UN-E145)	Receptacles: Fiberboard, Metal (for rivets, explosives) Plastic, Wood	Boxes: Fiberboard (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2)	
US062 (UN-E146)	Not necessary	Boxes: Fiberboard (4G) Plywood (4D) Reconstituted wood (4F) Steel (4A1) Wood, ordinary (4C1)	14, 16

TABLE OF PACKAGING METHODS—Continued

(1)	(2)	(3)	(4)
US061 (UN-E145)	Receptacles: Fiberboard, Metal (for rivets, explosives) Plastic, Wood	Boxes: Fiberboard (4C1) Plywood (4D) Reconstituted wood (4F) Steel, with inner liner or coating (4A2)	
US062 (UN-E146)	Not necessary	Boxes: Fiberboard (4G) Plywood (4D) Reconstituted wood (4F) Steel (4A1) Wood, ordinary (4C1)	14, 16.
US063 (UN-E146)	Not necessary	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F)	14, 16.
US064 (UN-E146)	Not necessary	Boxes: Steel (4A1) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F)	14, 16.
US065 (UN-E147)	Receptacles: Fiberboard, Metal	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Drums: Fiber (1G)	
US066 (UN-E149)	Optional	Boxes: Wood, ordinary (4C1)	15, 16, 41, 49
US067 (UN-E150)	Boxes: Fiberboard Receptacles: Metal, Plastic Sheets: Paper, Kraft	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1) Drums: Fiber (1G)	12, 15.
US068 (UN-E151)	Receptacles: Metal, Plastic, Wood, Fiberboard	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1) Drums: Fiber (1G)	42, 43, 44.
US069 (UN-E153)	Sheets: Fiberboard, corrugated Tubes: Fiberboard Intermediate: Receptacles: Fiberboard, Metal, Plastic	Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1)	45.
US070 (UN-E156)	Bags: Plastic Boxes: Fiberboard Tubes: Fiberboard, Plastic, Metal Note: Dividing partitions in the outer packaging may be used in place of inner packaging	Boxes: Fiberboard (4G) Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1) Steel, with inner liner or coating (4A2)	15.
US071 (UN-E157)	Not necessary	Boxes: Wood, ordinary (4C1) Plywood (4D) Reconstituted wood (4F) Steel (4A1)	14, 16.
US072 (UN-E103)	Must be specifically authorized prior to transportation. See §§ 173.56 and 173.57 of this subchapter. For an international shipment, the package must be marked with "Packaging authorized by competent authority of the United States of America (USA)."		
US073	Jet perforating guns, charged, oil well, may be transported under the following conditions: (1) Only by private highway carriers engaged in oil well operations. (2) No initiation devices (detonator, blasting cap, electric or non-electric) may be affixed to or installed in guns. (3) Motor vehicles must have specifically built racks or carrying cases designed and constructed so that the guns are securely held in place during transportation and are not subject to damage by contact, one to the other or other articles or materials carried on the vehicle. (4) Each shaped charge affixed to the gun may not contain more than 112 grams (4 ounces) of explosives. (5) Each shaped charge, if not completely enclosed in glass or metal, must be fully protected by a metal cover after installation in the gun. (6) The assembled gun or guns packed on the vehicle may not extend beyond the body of the motor vehicle and must be secured in the body of the motor vehicle in a fixed position so as to prevent movement relative to each other or in the body of the motor vehicle. (7) Initiation devices carried on the same motor vehicle must be segregated; each kind from every other kind, and from the guns, tools, or other supplies. Initiation devices shall be carried in a container having individual pockets for each such device or in a fully enclosed steel container lined with a non-sparking material. No more than two initiation devices per gun shall be carried on the same motor vehicle.		



(d) Table of particular packaging requirements or exceptions.

Number identifying packaging requirement or exception	Explanation of packaging requirement or exception	Number identifying packaging requirement or exception	Explanation of packaging requirement or exception	Number identifying packaging requirement or exception	Explanation of packaging requirement or exception
1	Water soluble substances must be packed in waterproof receptacles.	8	The inside of drums and jerricans must be galvanized, painted or otherwise protected. Bare steel must not come into contact with smokeless powder.	17	Quantity limitations for all detonators are as follows unless specifically defined for each type of detonator:
2	Packages must be lead free.	9	Drums or jerricans of steel must be constructed without pockets or crevices in which smokeless powder could be trapped or ripped.	(a) For detonators containing no more than 10 grams of explosive (excluding ignition and delay charges):	(i) No more than 50 detonators may be packed in one inner packaging
3	The barrels and drums must have a watertight seal.	10	Metal receptacles must be so constructed that the risk of explosion, by reason of increase in internal pressure from internal or external causes, is reduced.	(ii) No more than 500 detonators may be packed in one outer packaging.	(b) For detonators containing no more than 3 grams of explosive (excluding ignition and delay charges):
4	The intermediate and outer packagings must be filled with water or an appropriate water saturated material when the intermediate packaging is a rubber or rubberized textile bag.	11	The inner packagings must be sealed.	(i) No more than 100 detonators may be packed in one inner packaging.	(ii) No more than 1000 detonators may be packed in one outer packaging.
5	The particular packing requirements are made in the interest of safety. They do not guarantee that articles so packed will be classified as shown. Assessment of the hazard must be made in accordance with the classification procedures described in § 173.56 of this subchapter.	12	Outer boxes of natural wood may be provided with tin-plate liner having a sealed lid.	(c) There are no quantity limitations for detonators classed as 1.4B or 1.4S.	The number of detonators that may be packed in each inner or outer (if inner packaging is not required) packaging is determined by:
6	The intermediate packaging must be secured within the outer packaging with spacers.	13	Open ends of inner packagings must be fitted with padded end caps or the outer packaging must be padded.	(i) The ability for that package to pass certain tests (see § 173.57 of this subchapter) that qualify the detonators to be classed as 1.4B or 1.4S, or	(ii) The gross weight limitations of the packaging used.
7	Metal drums used for powder paste must be so constructed that explosion is not possible by reason of increase in internal pressure from internal or external causes.	14	The articles must be secured to prevent significant movement.		
		15	The articles and inner packagings must be secured to prevent significant movement.		
		16	Nails must not be used to secure the lids of wooden packagings.		

Number identifying packaging requirement or exception	Explanation of packaging requirement or exception	Number identifying packaging requirement or exception	Explanation of packaging requirement or exception	Number identifying packaging requirement or exception	Explanation of packaging requirement or exception
18	Detonators containing no more than 1 gram explosive (excluding ignition and delay charges) that are electric blasting caps with leg wires 4 feet long or longer, delay connectors in plastic sheaths, or blasting caps with empty plastic tubing 12 feet long or longer may be packed as follows: (a) No more than 50 detonators in one inner packaging; (b) IME Standard 22 container or compartment is used as the outer packaging; (c) No more than 1000 detonators in one outer packaging; and (d) No material may be loaded on top of the IME Standard 22 container and no material may be loaded against the outside door of the IME Standard 22 compartment.		tion and delay charges) must be packed as follows: (i) No more than 50 detonators in one inner packaging. (ii) No more than 500 detonators in one outer packaging. (e) Detonators containing no more than 3 grams of explosive (excluding ignition and delay charges) must be packed as follows: (i) No more than 110 detonators in one inner packaging. (ii) No more than 5,000 detonators in one outer packaging.	36	Venturis of rockets (fireworks) must be plugged and means of ignition fully protected.
19	Inner packaging is not required for electric blasting caps when packed in pasteboard tubes, or when their leg wires are wound on spools with the caps either placed inside the spool or securely taped to the wire on the spool, so as to restrict freedom of movement of the caps and to protect them from impact forces. No more than 500 electric blasting caps shall be contained in one outer packaging.	23	The inner packagings must be separated from the outer packaging by a gap of not less than 25 mm (0.98 inch) of cushioning material, e.g., sawdust, wood wool.	37	The detonating fuses must be separated from each other in the inner packaging.
20	Detonators that are classed as 1.4B or 1.4S and contain no more than 1 gram of explosive (excluding ignition and delay charges) must be packed as follows: (a) No more than 50 detonators in one inner packaging; (b) IME Standard 22 container is used as the outer packaging; (c) No more than 1000 detonators in one outer packaging; and (d) Each inner packaging is marked "1.4B Detonators" or "1.4S Detonators", as appropriate.	24	Blasting caps are not required to be attached to the safety fuse, metal clad mid detonating cord, detonating cord, or shock tube.	38	Primers fitted with anvil, composition not covered with a disc of metal foil or other material (varnished only). (a) The primers must be packed in rows in single layers in trays of fiberboard or plastic. (b) Not more than 500 primers shall be packed in an inner packaging.
21	Intermediate packagings are required only for non-electric detonators that are blasting caps or delay connectors in metal tubes.	25	Inner packagings are not required if the packing configuration restricts freedom of movement of the caps and protects them from impact forces.	39	Primers not fitted with an anvil, composition covered, not more than 5,000 primers shall be packed in an inner packaging.
22	Detonators that are blasting caps (including percussion activated) or delay connectors in metal tubes must be packed as follows: (a) The detonators must be packed in an inner packaging with the open end of any detonator covered with appropriate cushioning material; (b) Inner packagings must be snugly packed in an intermediate packaging; (c) Intermediate packagings must be separated from the outside packaging by at least 25 mm (0.98 inch) of cushioning material; (d) Detonators containing no more than 10 grams of explosive (excluding igni-	26	Quantity limitations for detonator assemblies with detonating cord are: (a) No more than 50 detonator assemblies shall be packed in one inner packaging. (b) No more than 500 detonator assemblies shall be packed in one outer packaging.	40	The primers must be packed with shock absorbent layers of felt, paper or plastic to prevent propagation within the outer packaging.
		27	Quantity limitations for detonator assemblies with safety fuse or shock tube are: (a) No more than 50 detonator assemblies shall be packed in one inner packaging. (b) No more than 1,000 detonator assemblies shall be packed in one outer packaging.	41	The outer plastic packagings must be reinforced with metal at corners and edge.
		28	Metal inner packagings must be padded with cushioning material.	42	The signals must be separated to prevent contact with one another and kept apart from the bottom, walls, and lid of the outer packaging, e.g., by cushioning material.
		29	The shaped charges must be packed so that contact between them is prevented.	43	Where the signals are contained in magazines for fitting into automatic units, the magazine may replace the inner packaging provided adequate cushioning material is used.
		30	The conical cavities of the shaped charges must face inward in pairs or groups to minimize the shaped charge (jetting) effect in the event of accidental initiation.	44	Tin-plate inner packagings must be sealed.
		31	The ends of the articles must be sealed.	45	The sounding device must be wrapped individually in corrugated fiberboard sheets or inserted in fiberboard tubes.
		32	The ends of the detonating cord must be sealed and tied fast.	46	Absorbent cushioning material must be inserted.
		33	The ends of the detonating cord must be sealed. Spaces must be filled with packing material.	47	Large articles without propelling charge and without means of ignition or initiation may be carried unpacked.
		34	Packagings must be sealed against the ingress of water.	48	Large articles without their means of initiation may be carried unpackaged.
		35	The detonators must be cushioned to prevent significant movement and contact between them.	49	Large articles without their means of ignition may be carried unpackaged.
				50	Large articles may be carried unpackaged.
				51	Bags, sift-proof (5H2) recommended only for flake or prilled TNT in the dry state and a maximum net mass of 30 kg (66.1 pounds).
				52	Plastic inner packagings must not be liable to generate sufficient static electricity that a discharge could cause the packaged articles to function.
				53	Not more than 50 grams (1.75 ounces) of a substance shall be packed in an inner packaging.
				54	Shall not be packed in the same package with detonators or with any detonating explosive

**§ 173.63 Packaging exceptions.**

(a) Cord, detonating (UN 0065), having an explosive content not exceeding 6.5 grams (100 grains) per 30 centimeter length (one linear foot) may be offered for transportation domestically and transported as Division 1.4 Compatibility Group D (1.4D) explosives, if the gross weight of all packages containing Cord, detonating (UN0065), does not exceed 45 kg (99.2 pounds) per:

- (1) transport vehicle, freight container, or cargo only aircraft;
- (2) off-shore down hole tool pallet carried on an off-shore supply vessel;
- (3) cargo compartment of a cargo vessel; or
- (4) passenger-carrying aircraft used to transport personnel to remote work sites, such as offshore drilling units.

(b) Detonating fuzes or ignition devices must not be assembled in the articles or included in the same outside package with the articles unless shipped by or for the DOD and in accordance with established practices and procedures specified by DOD.

(c) Smokeless powder for small arms in quantities not exceeding 45 kilograms (99.2 pounds) net weight transported in one rail car or motor vehicle may be classed as a flammable solid when the completed package has been examined for this classification by the Bureau of Explosives or the Bureau of Mines and approved by the Director, OHMT. Maximum quantity in any inside packaging must not exceed 3.6 kilograms (7.9 pounds) and inside packagings must be arranged and protected to prevent simultaneous ignition of the contents.

(d) Rocket motors may be shipped in a propulsive state or with igniters assembled therein only under conditions approved by the Department of Defense (DOD) or the National Aeronautics and Space Administration (NASA).

(e) Rocket motors, liquid fueled or cartridges, power devices (other than in Division 1.4) may not be shipped with igniters assembled therein unless shipped by or for the DOD or NASA in

accordance with established practices and procedures specified by DOD or NASA.

(f) Packaging for cartridges, small arms, as ORM-D must be as follows:

(1) Ammunition must be packed in inside boxes or in partitions which fit snugly inside the outside packaging or in metal clips;

(2) Primers must be protected from accidental initiation;

(3) Inside boxes, partitions, or metal clips must be packed in securely closed strong outside packagings; and

(4) Maximum gross weight is limited to 30 kilograms (66.1 pounds) per package.

(g) Jet perforating guns classed as 1.4D may be offered for transportation and transported by private offshore supply vessels only when the guns are carried in the manner described in Packaging Method US073 or on offshore down hole tool pallets provided that:

(1) The total explosive contents does not exceed 9.1 kilograms (20 pounds) per pallet;

(2) Each cargo vessel compartment may contain up to 90.5 kilograms (199.5 pounds) of explosive content if the segregation requirements of § 176.83(b)(3) of this subchapter are met; and

(3) When more than one vehicle or pallet is stowed "on deck" a minimum horizontal separation distance of 3 meters (9.8 feet) must be provided.

14. Appendix D would be added to part 173 to read as follows:

**Appendix D—Test methods for dynamite (Explosive, blasting, type A).**

**1. Test Method D-1—Leakage Test**

A wooden stick, 114mm (4.5 inches) long and 4.8mm (0.2 inch) in diameter, with a sharpened end is used to punch 5 holes in one end of the wrapper of a dynamite cartridge. A cork stopper is placed on the bottom of a glass volumetric cylinder. The dynamite cartridge is placed, perforated end down, resting on the cork stopper in the cylinder. The entire assembly is placed in an oven at 37.8 °C. (100 °F.) for 48 hours and then examined visually for evidence of leakage.

**2. Test Method D-2—Centrifugal Exudation Test**

The test apparatus consists of a glass tube, 135mm (5.3 inches) long and one inch in diameter, with both ends open, and is assembled in the following manner:

(i) place a plastic plug of diameter equal to the inner diameter of the glass tube to close the bottom;

(ii) place a small amount of absorbent cotton on top of the plug;

(iii) place a plastic disk that matches the inner diameter to the glass tube and has seven small perforations on top of the cotton; and

(iv) place 10 grams (154 grains) of the dynamite sample on top of the disk.

The assembled glass tube is then placed in a hand operated centrifuge and spun for one minute at 600 rpm (revolutions per minute). The dynamite sample is then removed from the glass tube and weighed. The percent of loss is then determined by the loss in weight of the dynamite sample.

**3. Test method D-3—Compression Exudation Test**

The entire apparatus for this test is shown in Figure 1 of this appendix. The test is conducted using the following procedures:

(i) A glass tube, 135mm (5.3 inches) long and one inch in diameter, is held on a wooden base;

(ii) a small amount of absorbent cotton is placed into the bottom of the glass tube;

(iii) 10 grams (154 grains) of dynamite sample is placed on top of the cotton in the glass tube;

(iv) a small amount of absorbent cotton is placed on top of the dynamite sample;

(v) a plastic disk that matches the inner diameter of the glass tube and has seven small perforations is placed on top of the cotton;

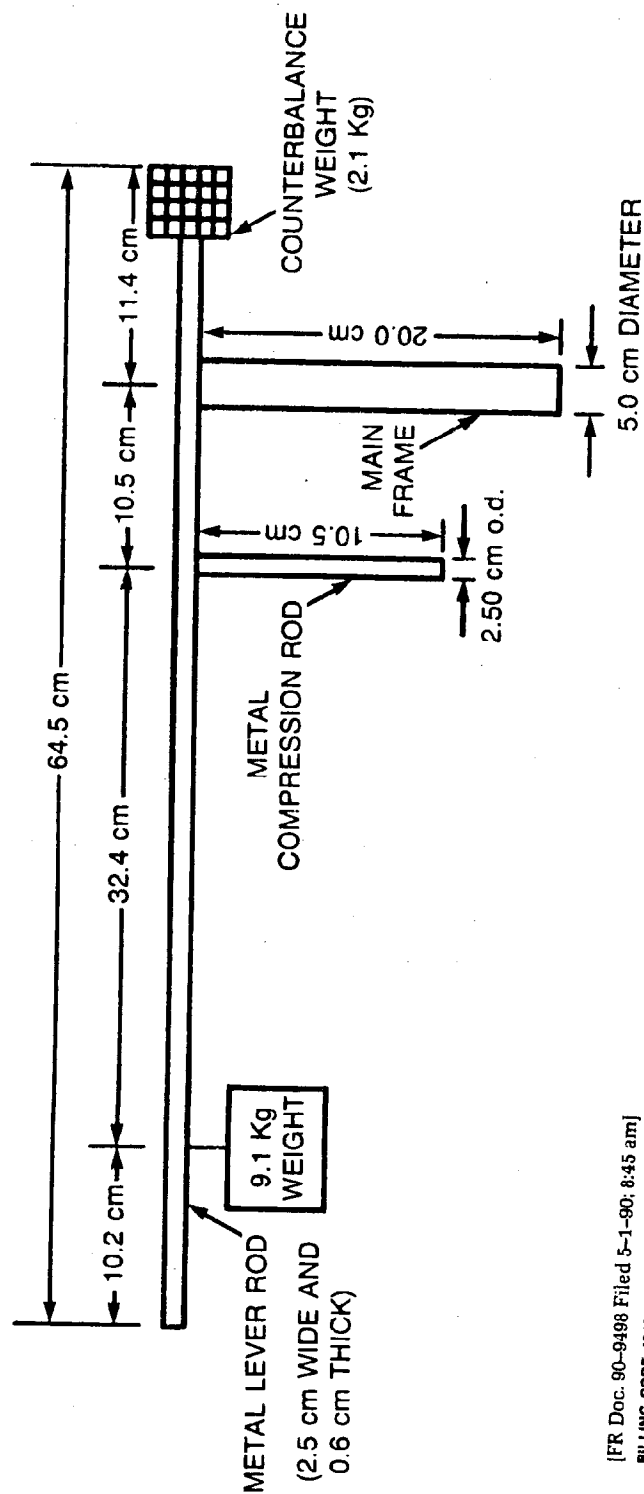
(vi) a plastic plug matching the inner diameter of the glass tube is then placed on top of the disk;

(vii) the glass tube assembly is placed under the compression rod and compression is applied by means of the weight on the metal lever rod. The sample is compressed for one minute; and

(viii) the dynamite sample is then removed from the glass tube and weighed to determine the percent weight loss.

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# FIGURE 1 COMPRESSION APPARATUS



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